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FIRST AERO WEEKLY IN THE WORLD

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Air Power and Sea Routes

AIR power is bringing about more than one modification in our plans for Empire strategy. Everyone has now grown accustomed to the idea that Great Britain as an island is no longer safe from hostile attack. The need for air defence of Great Britain has made us set up an elaborate system of defence which is entirely the concern of the Royal Air Force. The Navy can contribute little to it, and the Army nothing, except by supplying ground troops and guns which really ought to belong to the Air Ministry. The campaign envisaged is utterly different from the air activities of the Great War, when aircraft were purely ancillary arms of the Army and Navy.

The latest anxiety concerns the British position in the Mediterranean, and again the problems raised are novel. The ability of Britain to secure the passage of her ships from the Straits of Gibraltar to the Gulf of Suez is of vital importance to her connections with India, Australia, and New Zealand. So far as defence against hostile attack goes, those Dominions may be adequately guarded by the Singapore base; but the passage of merchant ships through the Mediterranean is necessary for the welfare of the Empire. The recent dispute of Italy with the League of Nations has brought to the front questions as to Britain's ability to keep that artery open in all circumstances. It is not a question of air bombs versus battleships, but of the new aspects of naval power which the addition of an air arm has introduced. The claims put forward in some quarters that aircraft have rendered fleets obsolete have not been proved, and, so far as unprejudiced eyes can see, are not likely to be proved; but fleets equipped with aircraft have new powers as well as new risks. It is possible that in a fleet action the attacking powers of the aircraft may prove to be but slight, and that their chief function will be reconnaissance and spotting for the guns; but the possibilities of air attacks on fleets in harbour must not be forgotten.

The Italian invasion of Abyssinia has taught us that little reliance can be placed in a pledge by the Italian Government on a "scrap of paper," and, therefore, we have to consider the possibility of Italian hostility in the Mediterranean. Malta is, from the air point of view, almost in Italy's pocket, and the harbour of Alexandria is not out of the range of Italy's Libyan possessions. Rhodes, too, is another Italian possession. That our fleet when at sea could more than hold its own against any Italian naval effort there is no doubt whatever, but the protection of harbours against air attack is a rather more anxious problem. The question of making a strong British naval base at Cyprus seems to deserve careful consideration.

A Problem for the Empire

Of course, in the event of such a deplorable happening as an armed dispute with Italy, the British Navy would not merely wait to be hit. Sir Samuel Hoare made that point quite clear. Our homeland is not in the Mediterranean, but Italy is. Moreover, supposing that Italy still had some connection with Abyssinia, a British air force at Aden could make it quite impossible for any Italian ship to use the harbour of Massawa. It would be foolish not to consider these unpleasant possibilities, even though we all hope that Signor Mussolini was quite sincere when he told the *Daily Telegraph* that he desired friendship with Britain.

The Mediterranean problem, none the less, is sufficiently complex as to cause anxiety to the Dominions. Mr. Pirow, the South African Defence Minister, is on his way to England to discuss it with the United Kingdom Government, and it would be a very good thing if an Imperial Conference were held to discuss the problem in all its aspects.

An Empire Air Race

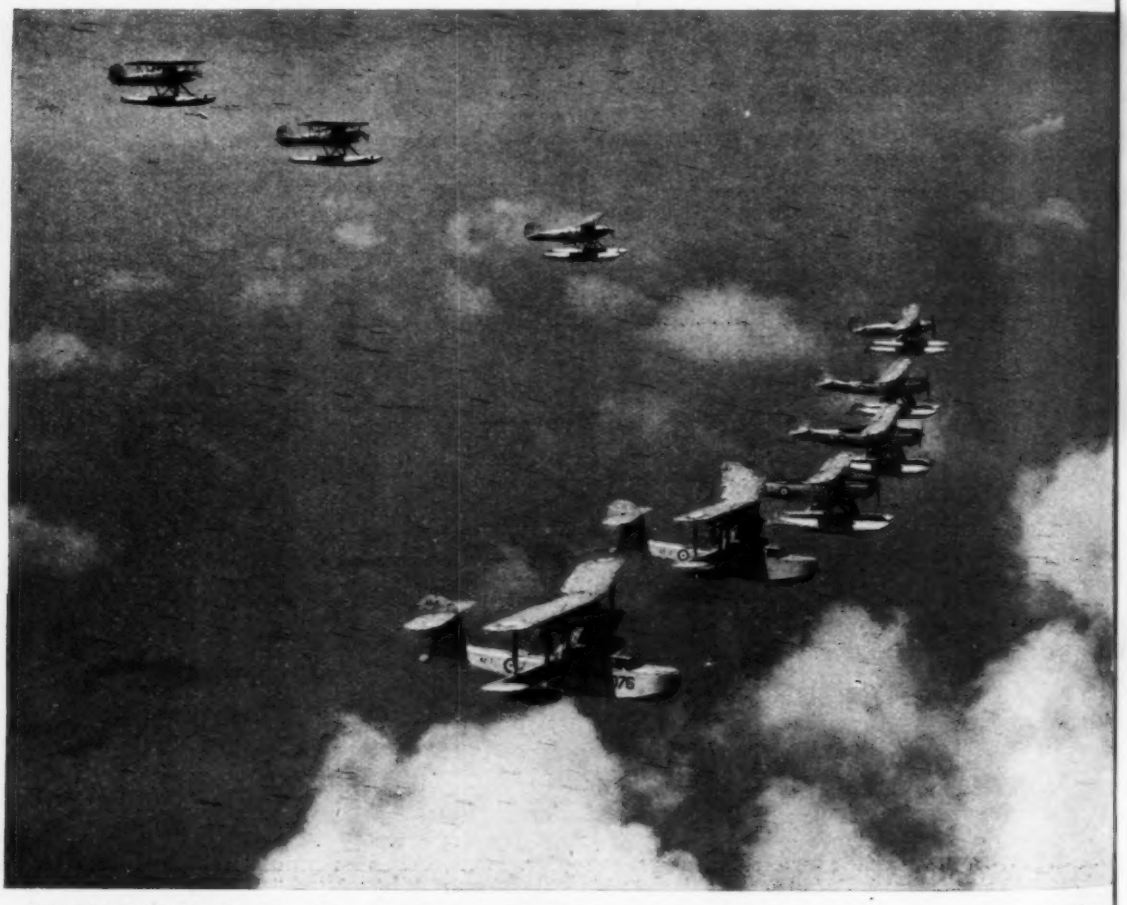
THE success of the international air race to Melbourne gives us good grounds for welcoming an Empire air race from London to Johannesburg. Mr. I. W. Schlesinger is worthily following in the footsteps of Sir Macpherson Robertson. The great difference between the conditions of the two races is that the Melbourne race was open to machines from all countries, while the race to Johannesburg is confined to those of the British Empire. There is much to be said in favour of international contests, provided that enough time is given for the design and building of special aeroplanes, but in this case there is no possibility of that being done. The Empire Exhibition at Johannesburg is to be opened on September 15 next, and the race will start from England on that day. If an international race were to be organised at such short notice, it would not test the designing capacity of the various nations, but would be a gift to any country which happened at the moment to possess a type of machine which suited the conditions of the race. Such a victory would really prove nothing, but might give a very false impression either of British supremacy or of British inferiority.

Another reason for making it impracticable to design special machines for this race is that at the moment the home aircraft industry is fully occupied with work for the expansion of the Royal Air Force, and so there is nothing for it but to carry out the race with existing machines. Despite that, the race will not be without an international flavour, because for some years past German commercial machines have been much used in South Africa. It will be a very good thing to let the greatest industrial city in the Union see and study for itself the performances of all sorts of existing British types.

Seeing for Themselves

The conditions of the race, it is understood, will take into consideration the commercial qualities of the competitors, and give marks of some description for qualities of that nature. The Union is about to inaugurate an internal air service of its own as soon as Imperial Airways open the new trunk route with Short flying boats down the East coast of Africa to Durban. This race will enable the business men of the Union to study the Empire's various landplanes, and judge for themselves which will be most suitable for the long internal stages, and which will be best for branch lines.

The South African papers and the broadcasting organisation may be trusted to make known the fortunes of each competitor. Few better ways of introducing British aircraft to South Africa could be devised.



MEDITERRANEAN MEDLEY. Two Supermarine Seagull Vs, three Fairey III Fs, and four Hawker Ospreys, all catapulted from ships of the Mediterranean Fleet, in the act of assuming a line abreast formation over Alexandria. The official name of the Seagull V, when used by the Fleet Air Arm, is Walrus ; the original title for it is retained by Australia.

The Outlook

A Running Commentary on Air Topics

Getting a Move On

FOREIGN nations which have been inclined to treat Britain as fangless and toothless because we have let our armaments decline in recent years cannot fail to be impressed by the energy with which the problem of aircraft production is being tackled by the Government.

Last Friday Sir Thomas Inskip in the House of Commons and Lord Swinton at the annual dinner of the Oxford University Air Squadron both spoke of the great aircraft factory which the Austin firm is about to build—the greatest aircraft factory ever built in this country, as Lord Swinton described it. It will be built at Cofton Hackett, beside the Austin works at Longbridge, at a cost of nearly £1,000,000, and will be able to employ over 5,000 workpeople. At the same time, seven firms, Austin, Rootes, Daimler, Standard, Rover, Singer and Wolseley, have formed themselves into what Lord Swinton called a team to organise among themselves the production of aero engines. Lord Swinton said that he was not fond of State factories; the trade knew more about production than he could possibly know. This team, Sir Thomas explained, had already put forward a cut-and-dried scheme for securing the necessary output with the minimum of delay. Sir Thomas uttered a somewhat ominous note in explaining what delay was likely to be inevitable, namely, the getting of the raw material and the men.

This difficulty of finding skilled workers is the most tragic outcome of the disarming and cheese-paring policy of recent years. The skilled workmen have been dissipated, some among other trades, while some, perhaps, have gone on the dole and forgotten part of their experience and skill. The delay in getting together a full complement of skilled workers is, perhaps, the most serious feature of the present situation; but with the energy now being shown by the Government and by the industry, that delay will certainly be cut down to the absolute minimum.

The "Pou" Position

IN view of the fact that two more *Pou-du-Ciel* crashes (one in this country, one in France, and both fatal) have occurred since we commented on the subject a fortnight ago, it is with considerable misgiving that we learn of the Air Ministry's refusal to test the *Pou* in the full-scale wind tunnel at Farnborough.

As *Flight* has already said, there are certain aspects of the *Pou* principle, notably that of a dangerous slot effect which may occur when the wing-gap is too small and the angle of incidence excessive, which cannot be cleared up by theoretical calculations; nor, for obvious reasons, can it be investigated in flight. The full-scale wind tunnel is the only remaining avenue.

Presumably one of the Ministry's reasons for refusing the test is that Farnborough already has its hands full with military aircraft work. Another reason, given by the Air Minister in answer to a question in Parliament, is that a test would be of little value, since most *Poux* show greater or lesser departures from the laws of Mignet. The retort to this seems to be that Farnborough should test a "strictly Mignet" model. Assuming that everything was found O.K., the Ministry could then announce that any *Pou*-builder who departed from the standard specification did so at his peril.

Of course, the question of engine varieties (and consequent changes of C.G. position) would prove a complication, and we should also have to face the problem of what to do in the event of Farnborough reporting adversely. Presumably the Air League, which has "fathered" the *Pou* in this country, and which has been most insistent in calling for an investigation of the accidents, would have a machine modified again and again until satisfaction was obtained. We do not envy Air Comdre. Chamier his task.

Safety First

IT might be amusing, if it were not so serious a matter, to realise that even in 1936 transport pilots do not *always* run up their engines and test their magnetos before opening up for the take-off. These engines have certainly been tested earlier in the day, and, in the case of a light aeroplane using the whole length of a big aerodrome, such a precaution might not always be vitally necessary.

Transport machines, however, are sometimes fully loaded, and in this state their take-off is sufficiently prolonged to make engine failure, or even loss of power, at the moment that the machine is air-borne a particularly serious matter. The pilot may then need to choose between various fatally solid objects—with a corresponding fall in the barometer of public enthusiasm for air travel.

Habit, of course, tends to make the best of pilots overconfident, particularly now that engine trouble is so rarely encountered, but this public enthusiasm is too important to be thrown away by momentary carelessness.

When travelling about the country one is more and more struck by the increasing interest in and knowledge of air transport. Gratifyingly sound opinions, on such matters as relative flying comfort, are heard in scraps of conversation between very unlikely persons and in unexpected places. A year of safe air transport, in this country and abroad, should "clinch the deal."

Going West

THE combination between Short Bros. and Harland and Wolff to build flying boats on Belfast Lough is the first step in two interesting new developments. In the first place, the Thames estuary and the Medway are tempting targets for enemy bombers, if any should ever come across. Should that disastrous day ever arrive, and the Rochester works go up in a grand pyrotechnic display, the Singapores and their successors can continue to come smilingly out of the Belfast sheds. It is to be hoped that Mr. Gouge (not to mention other friends) will previously have been transferred to the realm of the Six Counties.

We are sometimes told that with the increasing range of bombers soon no part of the British Isles will be immune from visits. That may be true, but the risks of the bombers are very much increased when they have to cross large stretches of land instead of merely popping unheralded across the Channel. The long overland flight gives the defence a fair chance of interception.

The second noteworthy point is the indication of the interest which the shipping world is developing in flying boats. There is not very much in common between building a giant Cunarder and constructing a Singapore III, and all the work on the thin sheets of Alclad, stainless steel, and suchlike metals will have to be done by the aircraft builders, not by the shipbuilders. Still, it is significant to see the two crafts which make boats drawing together, and perhaps in the long run both may benefit from the association.

ISLAND INTERLUDE

The start of the London-I.O.M. Race at Hanworth. Mr. Rowarth flags away the Hillson Praga, which subsequently won the Manx Air Derby.

A. Henshaw (D.H. Leopard Moth) Wins the London—Isle of Man Race at 126.75 m.p.h. : Severe Weather Over Most of the Route : Many Disqualifications : Manx Air Derby Won by First British-built Hillson Praga at 89.5 m.p.h.

WITH intermittent rainstorms of considerable intensity under a fairly low ceiling over the first leg of the course in the Isle of Man race, it might have been expected that there would be some retirements—at least among the less experienced competitors. And so there were, but not for an immediately obvious cause.

All the actual starters eventually got through to Speke, the official place for pause and refreshment, but the weather had been so bad from Stafford and was so bad at Speke that a comparatively large number of people failed to cross the finishing line and were either disqualified or lost valuable time before making a second circuit. Even the winner lost some time.

To emerge from the damp discomfort even of an open or a closed machine (the rain was so heavy at times that it entered through the most unusual places); to stand, walk or run in steady rain or over wet grass; to find that there is really no time for a meal; and to discover only when due to start that the line had not been crossed—these might damp the ardour of the most enthusiastic. Largely to the weather, therefore, must the inevitable complaints be contributed, for the finishing line was reasonably obvious, and everyone had been told where to look for it. The arrows were large enough—though heaven knows that it was difficult to see anything but an inadequate blur through soaked goggles or through the streaming and steaming windows of cabin machines.

The position of the finishing line at Speke was certainly obscure, but there had been some doubt about the question of whether this airport might "legally" be used at all, and it was decided at the last minute that the

Interest at Ronaldsway after the finish of the London-I.O.M. Race. In the foreground are F/O. Hughesdon's Wolseley-engined Hawker Tomtit (2nd), Mr. Humble's single-seater Gipsy Six Hawk (3rd) and the D.H.86 flown by Mr. Higgins (4th). Centre : Mr. A. Henshaw's winning Leopard Moth (Gipsy Major) arrives at Ronaldsway, having averaged 126.75 m.p.h.

arrangements must not interfere with the normal activities of the place. Hence the fact that the ground symbols were outside the boundary of the airport and on the north-east side.

So far as flying conditions are concerned, these were desperately uncomfortable rather than dangerous, though the low-powered machines, after necessary tree-top fighting in the heavy rain, occasionally had difficulty in climbing sufficiently steeply to keep pace with any rising ground which was encountered. Fortunately, there were no really sudden uprisings on the direct course between Hanworth and Liverpool. During the sudden downpours—including hail on occasion—the entire landscape was obscured, save for a patch more or less immediately beneath the machine. Otherwise, however, the visibility over the first hundred miles, at least, was good, and the inevitable bumps not too ferocious.

Early Casualty

There were actually twenty starters out of twenty-three entrants, though one machine, the Taylor Cub, immediately suffered mixture trouble and returned, after a round, eventually to retire at Hanworth. The entry was extremely representative, but only one other machine was of novel interest—the B.A. Swallow. This was fitted with a Cirrus Minor engine and has for some time been flying experimentally at Brough. The D.H.86a, entered by Blackpool and West Coast Air Services, carried

The winner of the London-I.O.M. Race, Mr. A. Henshaw, congratulated by the Mayor of Douglas, Ald. T. W. Cain, J.P., while the expression of Mr. Henshaw Senr., who acted as navigator, implies "Howzat?"

a load of fare-paying passengers (including a B.B.C. commentator), and was flown, appropriately enough, by Mr. J. C. Higgins, who pioneered the I.O.M. air service.

This machine was, in fact, flown at little more than cruising revolutions (2,150 r.p.m.), and at an indicated speed of 145-155 m.p.h., save for the last two minutes of the race, when full throttle was used to make sure that Gleave's Avian was caught before the line at Douglas. This, incidentally, was the only close finish recorded. Since, in fourth place, the 86's handicap time was only twelve minutes greater than that of the winner, continuous full throttle *might* have brought it into first place. However, it was being put back into normal service immediately on its return, and the risk of blowing-up an engine could not be countenanced. Unfortunately, most of the trailing aerial was lost at or near Squire's Gate aerodrome—and so, consequently, were the commentator's comments. This was particularly bad luck for the Marconi man, who had spent his whole time during the first

Second in the London-I.O.M. Race: Mr. J. Hopcraft (left) owner of the Hawker Tomtit, and F/O Hughesdon, the pilot. On the right is Mr. W. Humble (Hawk), who was third.

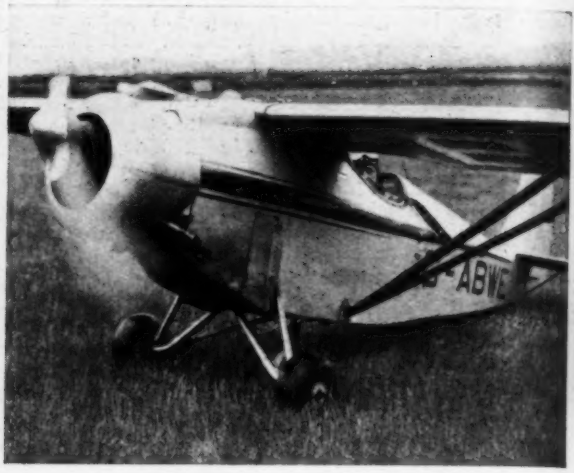
section of the flight in tuning the radio equipment for the job.

Despite the fact that the organisers had, by including Squire's Gate and St. Bee's Head among the turning points, reduced the open sea crossing to a minimum, it was surprising to discover that nearly everyone flew a straight line course between these points, and such machines as the Praga and Aeronca were seen flying at zero altitude even farther out to sea than was really necessary. Such tactics did, of course, allow the pilots to obtain the utmost from their machines, and the dry land was rarely more than a few miles away until they headed out from Cumberland. It was fortunate that the wretched visibility found over the last stretches of the first leg was not repeated over the sea. H.M.S. *Harebell* or not, there might otherwise have been some steady swimming. In actual fact, it was possible to see the Island from the Lancashire coast.

At Speke

All manner of things were happening at Speke which, owing to the rain and to the fact that the finishing line was far away from the club-house and the starting line, were rather difficult to follow. Certain it seemed to be that Flt. Lt. T. Rose and his King's Cup Miles Falcon, S. W. Sparkes (Percival Gull), R. F. Hall (Hillson Praga), F/O

Capt. Rex Stocken, organiser of the races, comments into the B.B.C. "mike."



On the left is Mr. Beard, the pilot of the interesting little American machine, the Taylor Cub, which was virtually a non-starter owing to carburation difficulties. The opening action at the side is noteworthy. Mr. Lowe's Comper Swift (right) has been improved in appearance by the fitting of an N.A.C.A. type of cowling designed and made by Mr. Cross, of Romford.

H. J. Wilson (B.A. Swallow), and G. Cohen (Puss Moth) had all failed to cross the line, though all but Rose came on to the Island, and both L. Lipton (D.H. Moth) and S. L. Turner (Cessna) lost so much time before going round again that they had little chance of appearing amongst the leaders. Turner, incidentally, was flying with a full load of passengers and luggage. The Redhill Flying Club's Autogiro, flown by their chief instructor, R. F. Bulstrode, damaged its tail wheel fittings and came along to the Island on Sunday, and I. P. Tidman (Westland Widgeon) was unlucky enough to descend on an unmarked hole on the aerodrome itself (!), breaking things up fairly severely.

So far as the actual *arrivals* at Speke could show, there had been some sorting out of positions. The Praga and the Autogiro had overtaken the Aeronca, which, incidentally, had averaged 68.77 m.p.h. Lipton had moved up five places, and A. Henshaw (Leopard), carrying his father as navigator, was already moving up.

The Backmarkers

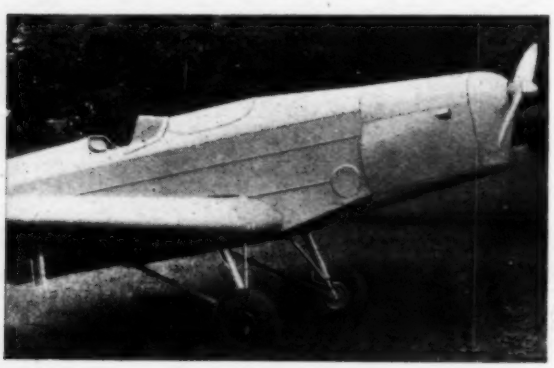
On the final section everything was, of course, changed out of all recognition. Henshaw and F/O C. F. Hughesdon, flying J. G. Hopcraft's Tomtit, had worked up through what remained of the field—the latter, judging from his speeds, must have held a remarkably accurate course—while the back-markers, W. Humble (Miles Hawk) and J. C. Higgins (D.H.86a), followed respectively into third and fourth places after overtaking the two Avians, the Aeronca and the Praga. Although their names do not appear in the finishing order, the Misses Glass deserve mention for getting through to the Island at all in an open machine with their comparatively small flying experience. It must have been an uncomfortable and frightening passage for them, and involved a forced landing near Hooton. Both Humble and Henshaw, incidentally, lost quite a lot of time over the Speke business, and the former also suffered distributor trouble, crossing the water with only one magneto in action.

In the evening the prizes were distributed by H.E. the Lieutenant-Governor, Sir Montagu Butler, K.C.S.I. Additional to the four money prizes for the first three places and for the maker of the fastest time, a fourth prize was given by the Parker Pen Company, and Mr. Alexander Duckham gave a special trophy to the first "B" licence pilot to cross the line—in this case Mr. J. C. Higgins.

LONDON-ISLE OF MAN AIR RACE RESULTS.

Pilot.	Machine.	Handicap Allowance.	Actual Flying Time.	Speed m.p.h.
		h. m. s.	h. m. s.	
1 A. Henshaw ...	D.H. Leopard Moth.	34 33	2 21 32	126.75
2 C. F. Hughesdon	Hawker Tomtit	52 19	2 47 47	107.90
3 W. Humble	Miles Hawk ...	Scratch	1 58 1	*152.00
4 J. C. Higgins ...	D.H.86a ...	6 14	2 5 18	143.18
5 S. Gleave ...	Avro Avian Sports.	1 6 58	3 6 7	96.25
6 H. R. A. Edwards	Avro Avian Sports.	1 8 35	3 19 22	90.00
7 A. E. Clouston...	Aeronca	1 56 40	4 9 15	72.15
8 S. L. Turner ...	Cessna C.34	14 48	2 42 21	110.50
9 L. Lipton	D.H. Moth	57 52	3 38 16	82.25

* Fastest time.



Spectators at Hanworth on Saturday obtained the first public view of the Cirrus Minor-engined B.A. Swallow (left) which has been undergoing tests at Brough. On the right is Mr. J. C. Higgins who flew the D.H.86a into fourth place in the race to the Island.

On the left is Mr. R. F. ("Toffee") Hall who flew the winning Hillson Praga in the Manx Air Derby, while on the right is Douglas' contribution to flying safety. The gentleman in the asbestos suit must have been superheated before the end of the day, for he conscientiously kept it on until all was over.

AROUND THE ISLAND

HAD it not been for the surprising velocity of the little fellows, both of which averaged well over 80 m.p.h. for the three-lap Manx Air Derby, things would have been a great deal more exciting. Unfortunately enough, it was obvious to the more mathematically minded spectators, after the Praga and the Aeronca had covered two laps, that they would take some catching.

There was certainly not a hope for the scratch man, W. Humble (Miles Hawk), and the majority of people were thinking that L. Lipton (D.H. Moth) stood the only fair chance. He eventually came in third, with Cohen's Puss Moth fourth, and the redoubtable Humble fifth. The latter had averaged 179 m.p.h., and had overtaken thirteen competitors on his hurtling circuits.

The course from Ronaldsway passed round Douglas Head, Cornaa (between Laxey and Maughold Head), Bride (near the Point of Ayre), Peel Castle, St. John's, and back to the starting point, where the machines turned around one perfectly good bell tent on the intermediate circuits

MANX AIR DERBY RESULT.

Pilot.	Machine.	Handicap.	Flying time.	Speed m.p.h.
		h. m. s.	h. m. s.	
1. R. F. Hall ...	Hillson Praga ...	1 3 37	1 48 28	89.5
2. A. E. Clouston	Aeronca	1 9 42	1 57 52	82.5
3. L. Lipton ...	D.H. Moth ..	30 21	1 23 22	116.5
4. G. Cohen ...	D.H. Puss Moth	24 45	1 18 39	123.5
5. W. Humble ..	Miles Hawk ...	Scratch	54 20	179.0
6. A. Henshaw ...	D.H. Leopard Moth.	17 5	1 11 57	135.25
7. A. K. Watson	D.H. Puss Moth	24 6	1 18 59	123.0
8. S. W. Sparkes	Percival Gull ...	4 21	59 25	164.0
9. C. H. Tutt ...	D.H. Moth ...	38 33	1 33 43	104.0
10. C. F. Hughesdon.	Hawker Tomtit	27 27	1 23 17	116.5
11. H. R. A. Edwards.	Avro Avian ...	35 55	1 32 17	105.0
12. S. T. Lowe ...	Comper Swift ...	21 37	1 18 44	123.5
13. S. Gleave ...	Avro Avian ...	31 15	1 32 41	104.75
14. S. L. Turner ...	Cessna C.34 ..	7 0	1 7 7	145.0
15. P. Randolph ...	Percival Gull ...	16 2	1 16 22	127.25
16. H. J. Wilson ...	B.A. Swallow ...	33 27	1 37 30	99.5
17. R. F. T. Giddings.	Blackburn Bluebird.	45 17	1 51 3	87.5
18. Miss M. Glass...	D.H. Moth ...	40 23	1 57 4	85.0

and crossed a clearly defined finishing line on the aerodrome after the final round. Incidentally, Capt. C. H. Pixton, who won the 1914 Schneider Trophy race, was one of the judges for each of the week-end events.

At the end of Round One it could be seen that the handicapping—carried out, of course, by Messrs. Dancy and Kowarth in both races—was working out well, so far as most of the field was concerned. The Praga had closed in the Aeronca, Lipton had picked up three places, and a Percival Gull, which was being flown magnificently by S. W. Sparkes, actually overtook Turner's Cessna on the inside of the turn. For the rest, there was little alteration save for a satisfactory closing-up. There was a good deal of somewhat unnecessary hedging and ditching, and on one occasion, of two machines approaching the turn, only one could be seen. The other was following the bed of a stream, and appeared only at intervals as a white flash behind the trees.

The end of the second lap saw big changes. The Praga was leading the Aeronca by a small margin; Lipton's Moth was in fifth place; Henshaw's Leopard had picked up three competitors—actually overtaking S. T. Lowe's Swift just before the turn; and the scratch man had gone up two places.

Humble, in fact, came through the field, as might be expected, on the last lap, and Sparkes did well to nose into eighth place. The only close finish occurred when Henshaw just managed to pass A. K. Watson's Puss Moth.

The only lady competitors, Miss Mabel and Miss Sheila Glass—the former in the cockpit of their Gipsy Moth. With very small flying experience they managed to get through to the Isle of Man in weather which occasionally frightened the most hard-boiled of pilots.

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

A COMMERCIAL machine developed from *Mister Mulligan*, "Benny" Howard's racer, is now flying.

Next Monday the *Graf Zeppelin* is to fly to South America, carrying only merchandise and samples.

Mrs. Amy Mollison was entertained to tea by women M.P.s at the House of Commons last week.

She has been presented with the gold medal of the Royal Aero Club, and a silver casket from the Corporation of Gravesend.

The revised version of the Hammond Model Y light pusher monoplane does 123 m.p.h. Its minimum speed is 39 m.p.h.

The big Loire flying boat built for Air France's transatlantic service is flying. It has four Hispano-Suiza "X" class engines.

A company with a capital of ten million rupees has been formed in Calcutta to manufacture motor cars and aeroplanes.

Part of the B.B.C.'s commentary of the *Queen Mary's* arrival in New York was broadcast from a Douglas. Capt. "Eddie" Rickenbacker took his turn as a commentator.

Forty R.A.F. officers lunched with Herr von Ribbentrop, Herr Hitler's Ambassador-at-Large, at Mount Stewart, Newtownards, the seat of Lord Londonderry, last Sunday.

Twenty-five Years Ago

(From "Flight" of June 4, 1910.)

". . . Just then his motor stopped for some reason, and he fell into the sea, from which he was rescued by a motor boat. To compensate, the aviator gave the crowd a series of thrills by flying in the form of a figure eight."

OPTIMISTIC NOMENCLATURE. This is what Mr. Gerard P. Herrick, its American inventor, terms a Vertiplane. The upper rotating wing is 20ft. in span and the lower one measures 25ft. The engine is a 125 h.p. Kinner. It seems that the machine has done extensive test-flying.

Wedding of Air Minister's Son

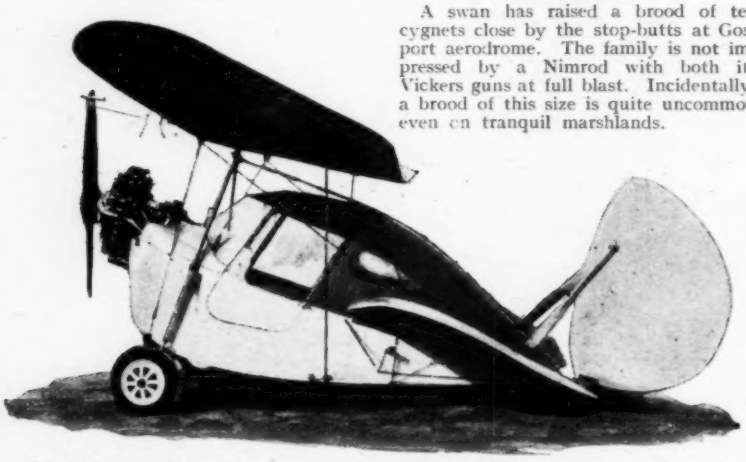
The marriage of the Hon. John Yarburgh Cunliffe-Lister, elder son of Viscount Swinton (Secretary of State for Air), to Miss Anne Irvine Medlicott took place last Thursday at St. Peter's Church, Eaton Square.

A New Fairey

The Fairey Company has produced for the Air Ministry a light reconnaissance seaplane with a Napier Rapier sixteen-cylinder "H" type engine. Doubtless the type is intended for operation from cruisers.

Home on the Range

A swan has raised a brood of ten cygnets close by the stop-butts at Gosport aerodrome. The family is not impressed by a Nimrod with both its Vickers guns at full blast. Incidentally, a brood of this size is quite uncommon even on tranquil marshlands.



POU FOR TWO. This photograph, reproduced by courtesy of *Les Ailes*, shows a new two-seater cabin version of the *Pou-du-Ciel* which has been built by M. Henri Mignet. The engine is a 45 h.p. Salmson.

By "Twin" from the Cape

Lord Nuffield's Airspeed Envoy is being flown up from the Cape in fast time by Sqd. Ldr. E. E. Hilton. Leaving Cape Town at 7.45 a.m. local time on Saturday, the Envoy arrived at Nairobi at 8 a.m. on Monday. The present record is held by Mrs. Amy Mollison (Percival Gull) with 4 days 16 hrs. 17 min.

High Octane Rating

At the Old Bailey, Mr. St. John Hutchinson, K.C., said to an ex-R.A.F. officer who was giving evidence: "Do you drink a mixture of gin, whisky, brandy, lime-juice, and soda? The officer: "Is that a cocktail?" Mr. St. John Hutchinson: "It is known as a R.A.F. cocktail—probably because it makes one want to fly."

A Sikorsky Project

Plans have been completed by the Sikorsky Company for a 55-ton flying boat with sleeping accommodation for 48 passengers. The wing span will be about 180ft., and the beam of the hull 15ft. The wing will be placed on the hull proper, as in our Short Empire boats. Six 1,000 h.p. engines will be installed and the cruising speed should be 170 m.p.h.

Empire Air Day Figures

The final figures show that on Empire Day 214,500 people were admitted to R.A.F. stations and that a total of £8,000 was taken; the major part of this sum will go to the R.A.F. Benevolent Fund. Hornchurch had the biggest attendance (14,500) and took £530. At Aldergrove, Ulster, the number was 11,800; Ternhill, Shropshire, had 10,500, and Hendon's return showed 9,500.

Correspondence

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for publication in these columns.

VOICE IN THE QBI WILDERNESS

AS an air W/T. operator who is rather keen on his job, I crave a little of your space to throw a few bricks.

Apparently airline companies carry wireless to render air navigation safer, but from my year of experience I find that, with the possible exception of Swissair's operators, a lot of my fraternity use their radio to fox the pilot and jam the aether, the breed carried by one of our larger companies, and the 1st Officer cum W/T. operator, being especially dangerous during the winter. In QBI conditions three repeats of a message is quite usual for them, and not having the Q code buttoned up, they have to have many messages spelt out to them. And after being given QGP1* when Croydon is QBI it shakes me to know that one or two more 'planes are whistling around in the same area, the operators on them having misunderstood or not heard their instructions.

And very few operators seem to listen to other aircraft but expect Control to keep them informed. After thirty minutes in the air any operator worthy of the name should have the position of almost every aircraft on his route taped.

Coming in QBI CZF, six bearings a minute at least should be obtained (with snappy co-operation from Control).

Ground stations would be much more efficient if they were not used to train raw operators; this, fortunately, is only noticeable with English stations on fine days and Sundays.

If wireless must be carried then do let us have good operators as well; and to obtain them I suggest that candidates for the Air W/T. Licence should have at least three years' experience, preferably Marine, before they are allowed to sit. This would definitely be a step towards safer navigation in bad weather, speed up air transport, clear the aether, and perhaps avoid the urgent necessity for another W/T. channel at Croydon.

EX-MARINE.

Croydon.

*["Your turn for landing is No. 1."—ED.]

A LANDING-FEE FUND?

THE decision of the members of the Aerodrome Owners' Association to charge landing fees to private owners appears to have aroused a good deal of comment and irritation out of all proportion to the imposition. Personally, I voted for the proposal, and still cannot understand the mentality of people who would never dream of refusing to pay green fees for the use of a golf course of which they were not members, or for parking charges for their cars; yet they expect to be able to fly about the country, using aerodromes which are both expensive to acquire and to maintain, and grumble about having to pay landing fees.

On the other hand, I am not unmindful of the asset which a large body of private owners has been and is to civil aviation. In my own experience, the Northamptonshire Aero Club practically grew round the Cirrus Moth which Geoffrey Linnell owned in 1927, and many pilots of to-day owe their introduction to aviation to a passenger flight at the invitation of a private owner. In the early days the clubs leased their aerodromes and controlled them, but few own their present aerodromes and are rarely the sole users or controllers. There is no reason, however, why the clubs should not still offer free hospitality to private owners and pay the landing fees themselves to the controlling authority. The following is an outline of a suggested scheme for providing the necessary machinery.

(1) Instead of subscribing to several clubs, as many do, each private owner should pay a subscription of, say, £5 5s. to the Royal Aero Club or the Council of Light Aeroplane Clubs, whichever agrees to administer the scheme, and all clubs in the country should be supplied with a list of subscribers and grant them reciprocal membership.

(2) The average landing fee for private aircraft is 1s. 6d., and the suggested subscription would provide for seventy landings by each private owner at the various clubs. Some will pay more visits, some fewer, but it would be a fair average to start with as a basis, and could be reviewed in the light of the necessary experience and statistics.

(3) When landing at a flying club, the private owner would sign a standardised "chit" certifying he was paying a private visit to the club; and at the end of the quarter, half-year or year, these "chits" would be sent to the Royal Aero Club or the Council of Light Aeroplane Clubs, where they would be analysed and sorted out to the various clubs. If the central fund is sufficient to pay the landing fees in full, as I anticipate, and leave a small balance, a cheque would be sent to each club to reimburse it for the full amount of the fees paid to the aerodrome owner in respect of private owner visitors.

Prudence dictates, however, that it would have to be provided that if the estimates were too low, and the fund was insufficient to pay landing fees in full, the clubs would have to make up the small deficit; but no doubt they would be quite willing to do this out of the large profits we hear so much about which they make out of private owners in the catering and licenced departments, petrol, oil, repairs, etc.

Under some such scheme as this I think all parties would be getting a fair deal: (a) The aerodrome proprietor would be getting his landing fees, which are badly required for upkeep and improvement; (b) The private owner would not have the irritation of being continually called upon to pay small fees and would feel that he had a right to use the aerodromes instead of merely being there on sufferance as at present, and would, moreover, be a full member of all clubs at a very slightly increased outlay, instead of a temporary member for the duration of his visit; (c) The clubs certainly might lose a small income from a few local private owners, but this would be more than compensated for by the increase in profitable visits from a larger number of private owners.

I do not, of course, know what the Royal Aero Club or the Council of Light Aeroplane clubs think of the scheme, but I am sending it at the same time to Mr. Harold Perrin for their consideration. In the meantime, and in view of the recent correspondence on the subject in *Flight*, I thought it would be as well to have the opinion of private owners upon it. I may say that local owners to whom I have submitted it have given it their blessing.

C. M. NEWTON.

Sywell Aerodrome, Northampton.

THOSE POUCULIARITIES

WITH all respect that is due to a designer of Mr. Latimer-Needham's qualifications, I venture to suggest that his theory of *Pou* instability, as set out in *Flight* of May 21, is quite unsound. He starts with the *assumption* that the thrust line is above the centre of drag; in his diagram he has raised the airscrew considerably, and it is incredible that the centre of drag is so low, especially at the lower speeds, when one remembers that most of the lift is taken by the front wing. One would expect the thrust to be below the drag—which would reverse Mr. Needham's main argument. But even with a high thrust line his reasoning seems wrong, and he seems to exaggerate the downwash effect; for if the thrust is increased the speed is increased, and if the stick is held in the same position the angles of attack are reduced and more of the lift therefore taken by the front wing, the machine therefore climbs unless the stick is eased forward. Of course, in a high-speed dive the fuselage drag is accentuated and the centre of drag lowered, but then the thrust is provided largely by the weight, and the C.G. is not high; the airscrew will even drag in high speed dives.

If a longitudinal dihedral is maintained a high-speed dive seems impossible, and as nobody wishes to do a T.V. dive in a *Pou* it would seem wise to limit the movement of the front wing so as to preclude all high-speed dives.

On some recent *Poux* there is a tendency to increase the vertical gap, but if the variation of the gap due to control movements *is* found to have peculiar effects on the lift of the rear wing there seems no serious objection to making the front wing fixed and the rear one pivot; except that the steadiness in bumps caused by the stick yielding during a bump, and claimed as a benefit of the system, would be lost.

Not having had an opportunity of flying a *Pou* I offer these comments with reserve and in the hope that they will stimu-

late others in the search for the truth. Aviation, being a science and not a religion, must always keep a mind open for new truths: its greatest heresy is prejudice. W. E. GRAY.

Edgware, Middlesex.

P.S.—Since writing the above I learn from Mr. Collins, Messrs. Puttnam's test pilot, that the fully stick-forward setting of the front wing is needed so that the present design of *Pou* may be jerked off the ground. I also understand from him that there is no tendency of the nose to rise on closing the throttle, so that the thrust cannot be much above the c.g., and the drag is more likely to be above than below the c.g. at the lower speeds.

WHILST agreeing in general with Capt. Needham's remarks (p. 556, May 21) on the danger points of the *Pou*, my own impression is that the vital point in *Pou* construction is to be certain that the C.G. is exactly in the right place. The distance between the C.P.'s of the two wings is very small, and small changes in the fore and aft position of the C.G. make big differences in the loading of the two wings. As the C.G. moves forward, the front wing has to be held at increasing angles of incidence to maintain trim. If the front wing is stalled while at a considerably greater angle of incidence than the rear wing, the rear wing may still be lifting strongly and promote a sudden catastrophic dive. (Incidentally, is there any information on the stalling properties of the unusual wing section employed?)

If the stick is held hard back, the trailing edge of the front wing is so near to the leading edge of the rear wing that there is bound to be reaction between the two, which may well make recovery impossible until the stick is pushed hard forward again.

In my own contacts with amateur *Pou* constructors I have found them very casual about making alterations and "improvements," and a matter of two or three inches of variation in the position of the C.G. might well be ignored. My advice, for what it is worth to anybody about to fly a *Pou*, is to make quite certain before he goes up that the position of the C.G., both vertical and horizontal, is exactly where Mignet specifies, not forgetting his own weight, which may differ considerably from that of the last pilot to fly the machine successfully.

Bramcote, Notts. R. F. J. GRANGER.

POUX AND THE LAW

YOU say on the "Outlook" page of *Flight* of May 14 that the third-party insurance is a sound method of looking after the safety of *Poux-du-Ciel* and other light aircraft (as you have also said previously) because the insurance companies would not insure machines of this type which were not sound.

I thought this a sound argument, until fairly recently, when I heard of a *Pou* being built and the builder having it insured without the insurance company so much as looking at it. Moreover, he would have actually preferred to have his machine inspected for his own satisfaction as he had had no previous aircraft experience. I have now learned that actually very few *Poux* are inspected, although I know that the Air League of the British Empire inspects them on request. But optional inspection is beside the point; the fact is that *Poux* are allowed to, and do, fly (if they are able) without being so much as seen by an inspector or anyone else, and they can be built by the most incompetent persons, too. I have heard of a case of a person who knocked up his machine with 2in. nails; having had no experience of making fittings, he somehow used nails to supersede them, and honestly expected someone to test-fly it for him.

You also say that "the Air Ministry accepted in principle that small private aircraft should be exempt from the usual airworthiness regulations." Is this borne out in fact? The *Pou* and the Super Drone are exempted. Are the Hillson Praga and the Aeronca, to take two examples?

This state of affairs with the *Pou* is particularly galling to those who have had years of shop and drawing office experience and are well qualified for the job they want to undertake, yet, on enquiring of the Air Ministry, after stating the extent of their experience and qualifications, if it would consider allowing an ultra-light aeroplane of conventional layout to be designed and built and be exempted from the full C. of A. formality, are informed that they will need the well-known necessary Air Ministry Publication, and that nothing can be considered further until the C. of A. fee stated in the Air Navigation (Consolidation) Order 1923 is paid. This, after the usual wait, turns out to be £25 for a machine up to 500lb. tare weight. I understand that all tests and everything else are charged up extra.

In other words, the Air Ministry effectively prevents anyone without considerable private means from producing an ultra-light machine, whilst some veritable death-traps for those on the ground as well as those flying them are allowed to proceed unhindered.

I do not wish it to be thought from what I have said about *Poux* that I think that they should return to the full Air Ministry control, but I do consider that all light machines for private use should come under a body like the B.G.A. (as has, I believe, been officially recommended), who go into the strength and airworthiness of sailplanes and gliders as well as inspecting machines during construction and after completion and issue C.s of A. for them, and charge a very reasonable sum for doing so. N. NEW.

London, S.W.16.

THE SUBSIDY SITUATION

From Admiral Sir Murray F. Sueter, C.B.E., M.P.

AS one who has devoted a great deal of time and thought to air questions I fully endorse all that Lord Elibank said in your columns (p. 530, May 21) about the need for centralising civil air administration and adopting a cautious policy with regard to the administration of the commercial airline subsidy.

The latter may seem small—in fact, according to Lord Elibank's comparative figures, it *is* small—but combined with efficiency of machines and personnel it should be adequate to ensure the commencement of a British air system second to none. We have always been the great carriers of the world by sea; is there any reason why we should not be the same by air?

There is another point about this air subsidy which should not be lost sight of. The more the subsidy is spread, the greater danger is there that the people will be tempted to invest their money in aviation concerns which are entirely speculative. There are far too many of these and the greatest safeguard for the uninformed investor is the concentration of subsidies upon those operating companies which have either proved their worth or can show definite evidence of a capacity to produce results.

I was particularly pleased to see Lord Elibank taking up the cudgels so effectively against those who have paid brief visits to the United States and seen evidences of superficial achievements in air matters and come back to decry our own system.

If the economies of flying are studied it will be found that America has lost very many millions in developing her civil aviation, and now we are informed by no less an authority than the American Federal Aviation Commission that "financial disaster is in the making for a larger part of the present air transport system." On the whole, I think our more cautious British air policy is wise. The Air Navigation Bill *now* before Parliament is on the right lines. It embodies very largely the good work of Lord Gorell and his Committee, and is a measure of outstanding importance to all those who desire the full development of air transport and air mail services throughout the Empire. MURRAY F. SUETER.

House of Commons.

ULTRA-LIGHT

THE Perman light aeroplane described in *Flight* of May 21, with the 10 h.p. Ford engine, is a very interesting effort and should, I think, supersede the *Pou*. The latter would appear to have a very stable wing arrangement for one setting of the wings, but one would expect it to exhibit vicious tendencies for wing settings outside a certain range. A solution might be to have both planes fixed and control by a conventional elevator fixed to the aft wing.

A light monoplane of conventional wing arrangement should be very little more costly to build than the *Pou*, and though perhaps not quite as stable as the *Pou* in its most stable attitude, it would be far more stable over the full range of flying attitudes. I have wondered if it might not be desirable for drawings and prints of such a machine to be made available, so that amateurs keen on building a plane for themselves might expend their energy to the best advantage.

Returning to the Perman machine, there is difficulty over one point in your description. Take-off revs are given as 3,300, and cruising revs as 3,100; should these figures be reversed, or is this an indication that optimum aircrew conditions have not yet been obtained?

[The makers give the take-off r.p.m. as 3,300; maximum, 3,600; and cruising, 3,100.—ED.] J. F. CUSS.

Gloucester.

Private Flying

Topics of the Day

Puddle Hopping—I

SOME months ago I heard that a well-known club was seriously considering the possibilities and costs of a seaplane-flying extension to their activities. Nothing more was learnt about it, so I imagine that they may have shelved the idea for the present. I feel that if they modified one of their machines and gave the project a year's trial, even at very much higher flying rates, they would probably collect a very useful nucleus of interested people.

For serious travelling, of course, a light floatplane is not very much use, but the members might become sufficiently numerous and enthusiastic to justify the purchase of an amphibian. No single member could afford to do much more than be "passed off" on it, but, thereafter, groups of them, with or without an instructor in charge, might care to hire it for a week or week-end and travel around the coast, landing at aerodromes or in sheltered water according to the different circumstances.

Nobody who has travelled in a flying boat will ever forget the experience, and it is curious that those ex-boat pilots who are now flying transport landplanes usually look forward to the day when they will be back in a boat again. I know one who actually went abroad to another job as a landplane pilot merely because he felt in his bones that his new company would be sure to operate flying boats in due course.

Puddle Hopping—II

IT was, I believe, the old American Loening amphibian which was originally and affectionately known as the "puddle hopper," but the name reminds me of another damp subject—leaking cabin aeroplanes. In this case one cannot hop, but must sit quietly in the puddles and bear the discomfort, if possible, with equanimity.

After some first- and second-hand experiences during the Isle of Man race last week-end I am beginning to wonder whether there are many cabin machines into which water does not enter when the rain is really heavy. During the race it was very heavy indeed at times, but it is still difficult to excuse the fact that some water, at least, entered the majority of the machines taking part—and not all of it through the movable windows.

It is easy, of course, to say that saloon cars are waterproof and to forget that an aeroplane is travelling about three times as fast, but I would rather be dressed for the part in an open machine (and get really wet) than sit in a state of damply suspended animation within a machine which is supposed to allow me to travel comfortably in ordinary clothes. When somebody gives me an idea of the actual pressure under which water may be forced through minute cracks while travelling at 150 m.p.h., I shall probably apologise to constructors in general.

Study in Airflow

NEVERTHELESS, it was interesting to watch the movements of a solid wall of water on and around the windscreen of a fast machine. One might have expected it to be pressed off in a clean sheet and to leave the screen itself in a state of smooth transparency. In fact, and in this particular machine, it was running in courses which might have interested an airflow expert.

Incidentally, those people who think of air as they would of water in its movements around a vessel are liable to forget the one salient difference between the two mediums—the fact that of the two only air is compressible to measurable extent. Consequently, the effects of interference drag, for instance, must be almost impossible to theorise upon with any real accuracy.

Aeronautical engineering, like every other form of engineering, appears to depend largely upon plain rule-of-thumb knowledge and on practical tests with pieces of wool and sandbags. The history of rigid airships—outside Germany—gives the lie to any suggestion that things can always be calculated to a nicety. After a hundred years of experience with metal ships, even these break up on rare occasions.

When Power is Necessary

DURING this somewhat unexpected revival of the low-powered aeroplane, one is liable to forget an important though rarely met aspect of the use of a minimum supply of power.

In really bad weather—other than very low cloud or fog, when no radio-less machine should be in the air, anyway—it is sometimes necessary to fly extremely low, and it is possible that one day the ground ahead might rise faster than the machine's own rate of climb. The sudden appearance of another machine or some form of obstruction, too, might demand an equally sudden change of vertical or horizontal direction of flight. A big reserve of either speed or power can be very useful in such circumstances.

Alternatively, a low-powered machine should have excellent slow-flying characteristics, so that an accidentally stalled or very slow-speed turn causes nothing worse than a mild loss of height on a level keel. The pilot who has done a great deal of flying in any particular "baby" would naturally do the right thing, but the inexperienced pilot might sling his machine around, depending for flying speed on any additional urge provided by full throttle.

The advantages of a good take-off—in distance rather than time—are obvious to everyone. It is all very well to get into a small field, but one must also get out of it, and safe slow-speed manœuvrability would allow the pilot to make a turn, if necessary, immediately after the take-off.

INDICATOR.

Private Flying

FROM the CLUBS

Events and Activity at the Clubs and Schools

HANWORTH

LAST week's big event was the start of the Isle of Man race. The week's flying times totalled 67 hr. 25 min. Mr. Adler became a member, and Messrs. Scott-Miller, D. R. Martin and E. K. Portman Dixon took their "A" licences. Messrs. L. Porter and Frizzoni went solo.

YORKSHIRE

Machines of the Yorkshire Aeroplane Club flew 50 hr. 30 min. last week. Mr. H. Williamson passed the tests for his "A" licence.

C. A. S. C.

Five members attended last Sunday, when the flying times were 2 hr. 5 min. solo and 1 hr. 25 min. dual. Mr. R. A. Carter went solo last Tuesday.

NORFOLK AND NORWICH

Just over forty hours' flying was recorded by the Norfolk and Norwich Aero Club last week. One-third of this was done in the Club's new Hornet Moth.

REDHILL

Messrs. Weller, Mussett and Dawson went solo, and Mr. S. D. May made his "B" licence night flight. There are four new members. Flying time for the week ending May 29 was 107 hr. 45 min.

KENT

At Bekesbourne aerodrome the Kent Flying Club flew 108 hr. during the four weeks ending May 30. New members were Mrs. Cherbery and Messrs. Hodgkinson, C. Randrup, M. Randrup, W. Tuäill, and D. Williams. Messrs. C. and M. Randrup went solo.

NOTTINGHAM

Flying time at Tollerton for the week ending May 28 was 27¾ hr. On several occasions bad weather prevented flying. Mr. J. F. Armitage qualified for his "A" licence, and Mr. R. J. Crisp joined the Club as a flying member. New associates are Miss E. G. Hackett and Mrs. Ramsay Smith, and Messrs. P. Pomeroy, J. Bissill, and G. Archibald. On Empire Air Day the Tollerton machines were taken over to Hucknall to co-operate with the R.A.F.

CAMBRIDGE

Flying times at Marshalls' Flying School, the Cambridge Aero Club and the University Aero Club for the week ending May 31 totalled 166 hr. Messrs. Carter, Thompson, and Riley-Smith went solo; Messrs. Harrop and Little became members; and Mrs. Walstone, the Hon. MacClintock Bunbury, and Messrs. Massey and Dixon-Spain completed their "A" licence tests. A Gipsy I Moth, G-AARH, has been added to the school fleet, bringing it up to ten machines.

LEEMING

Arrangements for the international luncheon to be held at York aerodrome on June 7, are in full swing. It is expected that French, German and Dutch machines will be present, in addition to the privately owned and club aircraft. Mr. W. R. Chown, managing director of F. Hills and Sons, Mr. Watts and Mr. Woolcock, all old pupils, have returned to the Club. Mr. P. L. O'N. Morris has taken his "A" licence. The flying time for the four weeks ending May 30 was 130 hr. 5 min.

CINQUE PORTS

Mrs. Maurice Davies and Mr. Derek Walker went solo last week and Mr. Morris went to Paris on a charter flight. Lord Crighton Stuart, in his Hobo, outward bound for Berck, spent a day at the Club. The Tiger is very much in demand and is attracting several "B" licence candidates. Mr. S. W. Ogden has joined to get experience of this machine and to have some advanced dual. Other new members are Cdr. H. A. Simpson, R.N., H. Constant, R. Heathcoat-Amory, E. H. Symonds, and W. R. Norman. Last week's flying time was sixty-three hours.

BROOKLANDS

One machine, which has been on loan to Lympne, has returned. Mr. E. H. Alliott has been making trips to Sywell each Sunday and putting in a day's instruction with the Club there. A competition run in conjunction with the Capitol Cinema, Walton, whereby the winner gets free instruction in flying up to the "A" licence, has proved so popular that it is being kept open for another month in order to give Mr. Ken Waller an opportunity of putting all the competitors through their tests. New members last week included Messrs. Symonson, Castlemaine and Pelicier. First solos have been made by Messrs. Whitton and Gunn. Mr. Riddell, of the College of Aeronautical Engineering, completed his "A" licence tests. Mr. Ken Waller made a taxi trip to Paris and Capt. Max Findlay delivered a Fox Moth to Southport.

LIVERPOOL

In face of unsettled weather with high winds, the Liverpool and District Aero Club flew 57 hr. 45 min. last week.

MADRAS

The total flying time recorded during April by the Madras Flying Club was 133 hr. 45 min. Mr. S. Ranganadhan went solo and Messrs. P. W. Lomax and D. Pieris passed their "A" licence tests.

BORDER

The weather kept away a number of aerial visitors on Empire Air Day, and a minor accident to one of the Club machines somewhat disorganised the programme. On the whole, however, the day was a success. Trial lessons were popular and brought in a number of new members.

PORTSMOUTH

Lt. D. Sanderson, R.N., has qualified for his "A" licence, and Miss Diana Ottley has joined the Club as an air hostess. New members are Miss V. P. M. Cooper, F/O. J. R. Watson, and Lt. W. A. Playfair, R.N. The flying times during the week ending May 29 totalled 38 hr. 5 min.

SOUTH COAST

Weather has been mixed, but over thirty-five hours was put in last week. Mr. W. L. Cornelius went solo. Those wishing to go to the International Meeting on June 13 and 14 by air are reminded that they must land before 2 p.m. Arrangements have been made for a dinner dance at the Grand Hotel, Brighton, on Saturday night so that there will be entertainment for the whole week-end.

Northamptonshire Rejuvenation

NEXT Sunday, following the opening of Perth and Gatwick airports on June 5 and 6, the Northamptonshire Aero Club's new clubhouse will be officially opened at 3.30 p.m.

R.38 Memorial Prize Winner

IN addition to those who, as reported in *Flight* last week, received awards at the R.Ae.S. reception, mention should be made of the name of Capt. J. Morris, B.A., who received the R.38 Memorial Prize. This award is made in recognition of the best paper on an aspect of aeronautical science, preferably having reference to airships.

Praga Cape Flight Data

SOME further figures are now available regarding Mr. H. L. Brooks' recent flight to the Cape in a Hillson Praga (reported in last week's issue of *Flight*). It is stated that his actual mileage worked out at 9,150, his flying hours 135 (making the ground speed 70 m.p.h., a good figure in view of the head winds encountered), his fuel consumption 30 miles per gallon, and the oil consumption 1,500 miles per gallon.

For the "L" Driver

IN view of the ever-increasing number of cars carrying learners' plates, it is worth recording that to-morrow our associated journal, *The Autocar*, publishes the first of a series of articles specially designed to assist learners. Not everyone beginning motoring is able to take a course of tuition at a good motoring school, and those placed in this position will find the difficulties of learning to drive, and correct management of their car on the road, will be greatly eased by this series of articles.

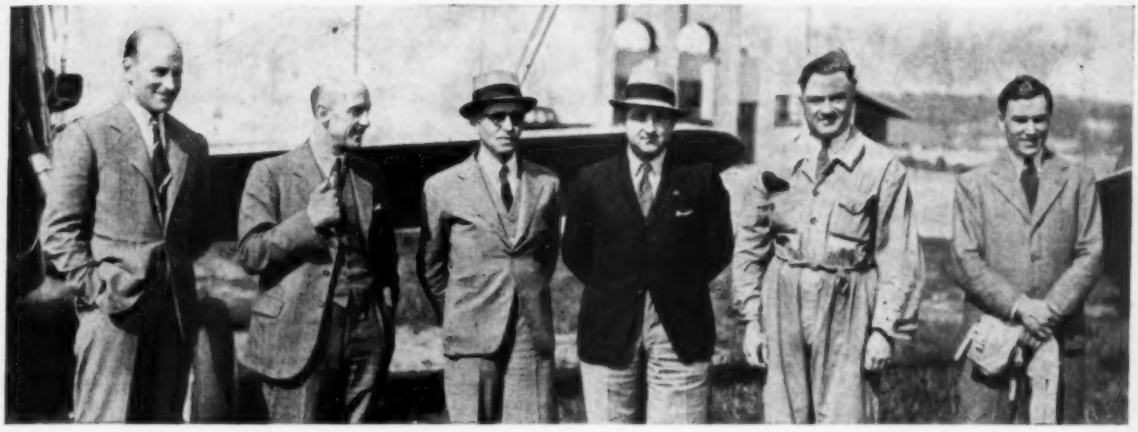
G.A.P.A.N. Reliability Trophy

SOME years ago, it may be remembered, Miss Alice Cumberbatch presented a trophy to the Hanworth Club. It was not, however, found possible to make any award, and the London Air Syndicate have generously withdrawn all claims to the trophy.

Arrangements have now been concluded by which it has been presented to the G.A.P.A.N., who will award the trophy amongst "B" licence pilots in respect of any act tending to increase reliability of our air routes. Details of the terms of award are now being drawn up and will be published in due course.

HERE and THERE

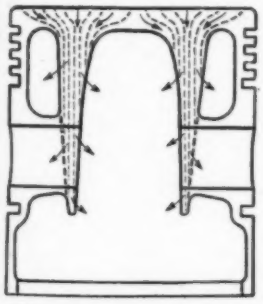
News in Pictures : Components and Accessories : More Views of a New Light Aeroplane



SPAIN APPRAISES : A group taken at Brooklands during the trials of the first three Hawker Furies for Spain. From left to right are Messrs. J. S. Hindmarsh and P. W. S. Bulman, of Hawkers ; Commander Aleman, the Spanish Air Attaché in London ; Commandant Las Morenas, of the Spanish Army ; M. Gaumont, who is over here on behalf of the Hispano-Suiza Company ; and Mr. P. C. Lucas, of Hawkers. (*Flight* photograph.)

Something New in Pistons

SOME extremely interesting features are to be found in the Worldwin piston, now being produced for use in air- and liquid-cooled aero engines. The outstanding point is a system of internal construction by which cooling ribs connect the crown, thrust and trail walls, and gudgeon-pin bosses. By this means, apart from the strengthening effect of the webs, the surfaces not actually in contact with the cylinder walls assist in cooling the piston. The gudgeon pin is placed practically in shear and does not subject either the bosses, or the outer walls of the piston adjacent to the bosses, to severe bending moments. It is stated that a piston of this type, subject to a compressive stress between the head and the gudgeon pin, carried a load of 18.77 tons per sq. in. undamaged, although it weighed only 1.89 lb.



A section through the Worldwin piston, showing how heat is conducted by the special webs.

Another type of Worldwin piston, now being developed for aero work, employing the same basic principle, is of the split-skirt or constant-clearance variety, giving particularly favourable results in the matter of lubrication efficiency at high temperatures. The makers state that examples have been in use in automobile engines using oil fuel during the last three years, and the life of the pistons has been found longer than the useful life of the cylinder; they have been under direct observation for more than 3,000 hours, including continuous runs for periods of fifty hours.

A third type, the design of which is also patented, differs in respect of the fins. These are relieved from the trail or non-working face of the piston, on which face is machined a vertical slot to permit radial expansion of the piston. This design has fully braced thrust walls the fins also serving to support the crown and gudgeon-pin bosses; it is made only as a split-skirt piston.

It is stated that a special foundry technique is necessary in the production of Worldwin castings. A sand core is used in conjunction with a permanent mould and the need of using chills is dispensed with. The form of core lends itself to casting.

The pistons can be supplied in recognised Air Ministry materials, although "Y" alloy is generally used. They are finished with diamond turning tools and the production of the gudgeon-pin holes is obtained by high-speed single-point diamond boring. The high standard of workmanship is maintained by exhaustive inspection methods employed throughout the course of manufacture.

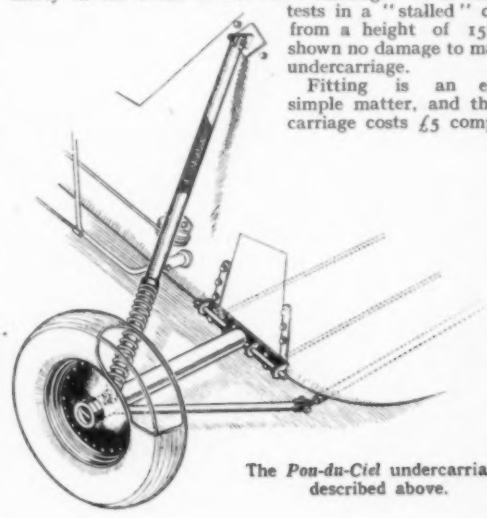
The makers, who have had long experience in automobile piston work, are Worldwin Pistons, Ltd., Cyfartha Works, Merthyr Tydfil, Glam.

Smoothing the Path of the Pou

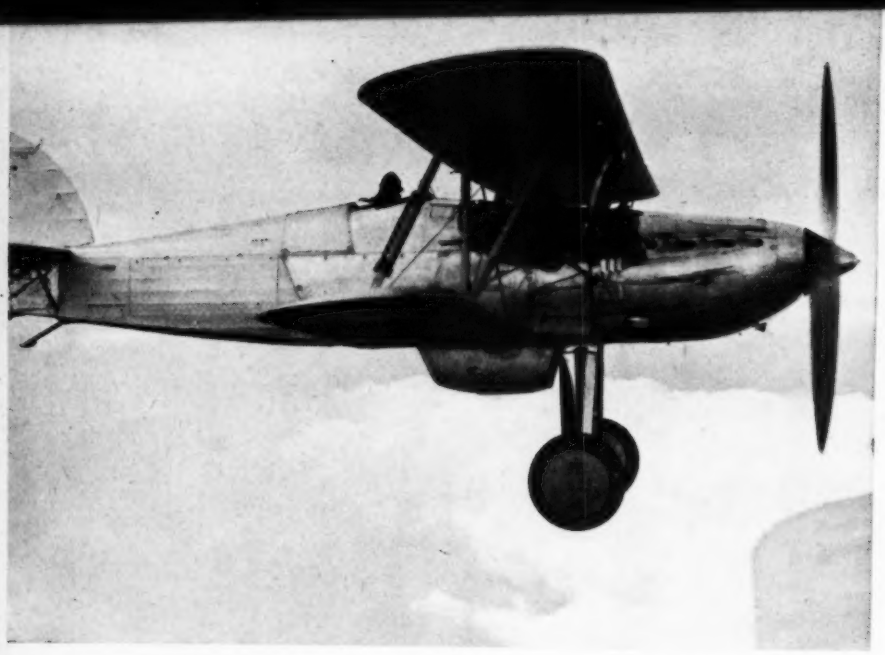
AN improved type of undercarriage for the *Pou-du-Ciel* has been evolved by Messrs. J. Ford and W. Reynolds, of The Guarantee Service, Gale Road, Harold Wood, Essex. The details, with the method of hingeing the axle and the arrangement of the compression-spring leg, are clearly shown in the accompanying sketch.

Among the advantages claimed are greater ground clearance, increased stability by virtue of the wider track, and increased safety in the event of one-wheel landings. It is stated that tests in a "stalled" condition from a height of 15ft. have shown no damage to machine or undercarriage.

Fitting is an extremely simple matter, and the undercarriage costs £5 complete.



The *Pou-du-Ciel* undercarriage described above.

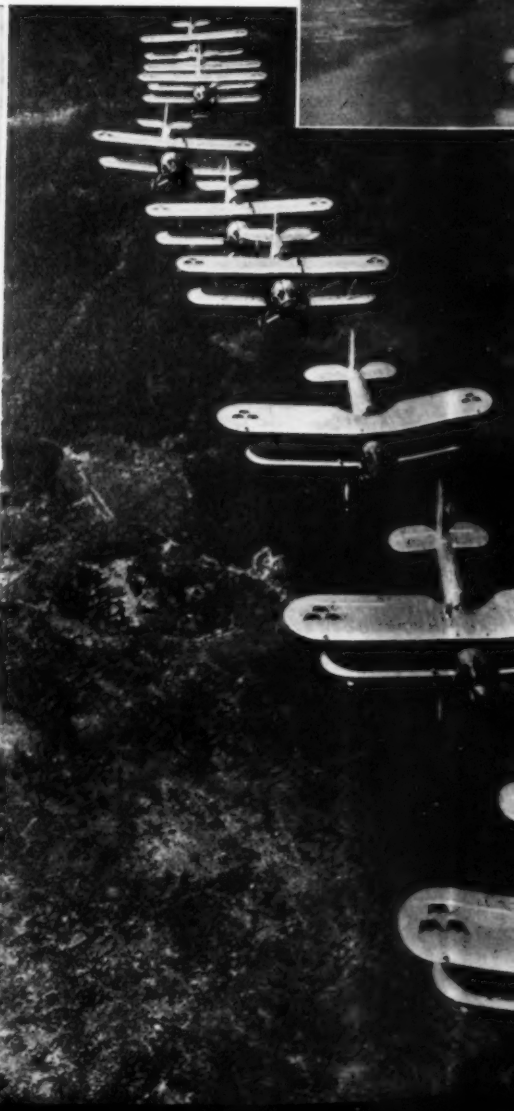


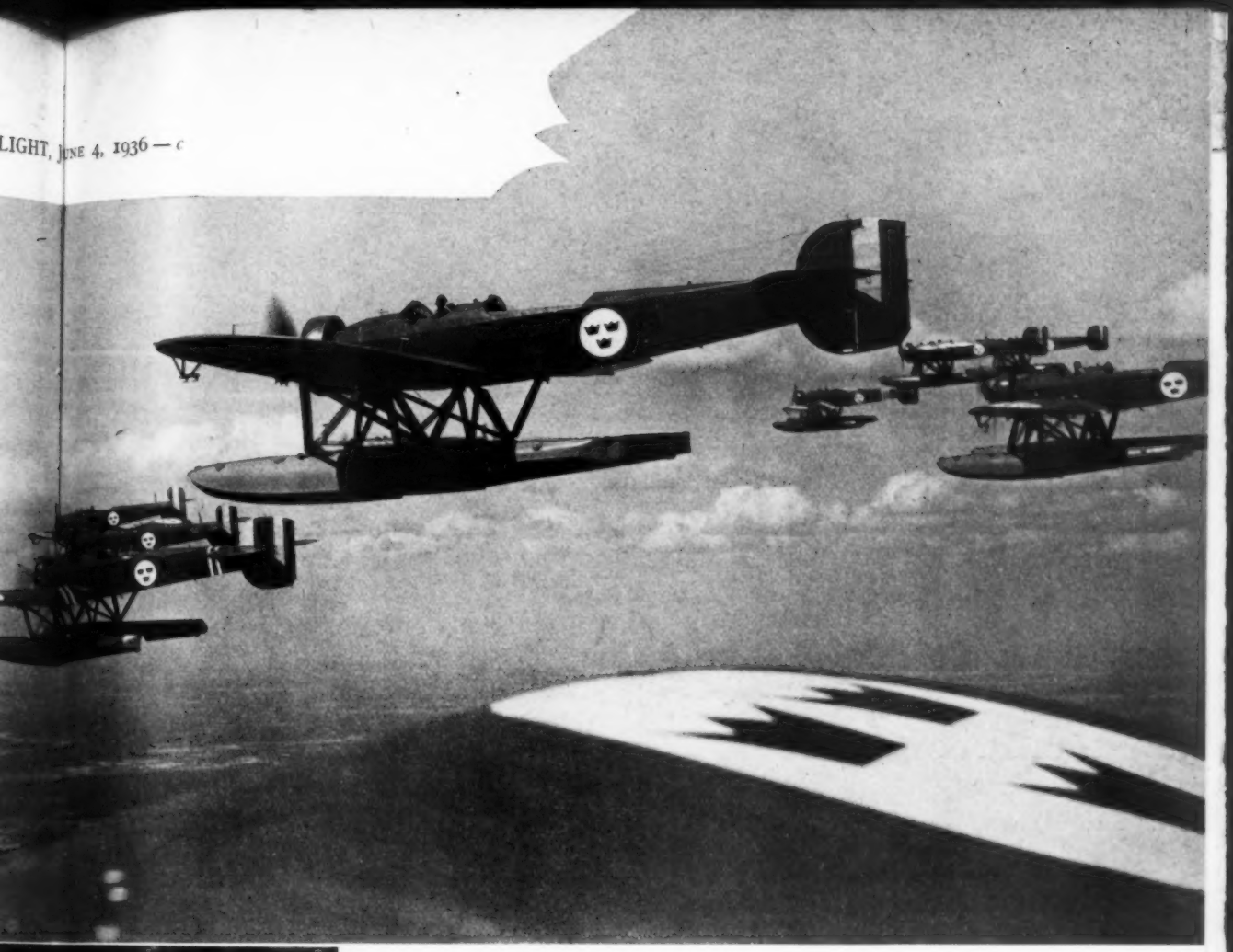
(Left) Mr. Lucas brings the first of the new 690 h.p. Hispano-Suiza-engined Spanish Furies close alongside "MR," flown by Mr. Hindmarsh and carrying our photographer. The radiator is further aft along the fuselage than on the Rolls-Royce-engined Furies in the R.A.F. The simplicity of the cantilever undercarriage with its Dowty internally sprung wheels is also apparent.

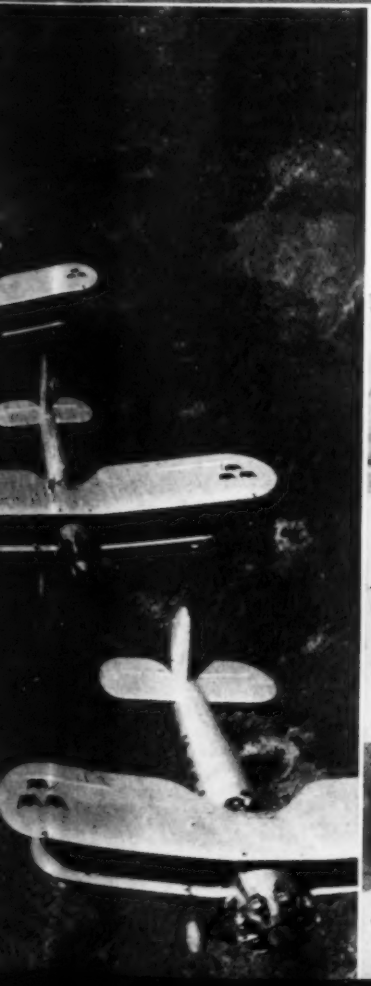
HERE and THERE in PICTURES

(Below) One of the new 176 m.p.h. Whirlwind-engined Seversky "basic trainer" monoplanes for the U.S. Army Air Corps. We should know it as an advanced trainer.

(Bottom) A Vickers Vildebeest floatplane, equipped as a bomber, in the act of touching down at Felixstowe after a test flight. (*Flight* photograph.)



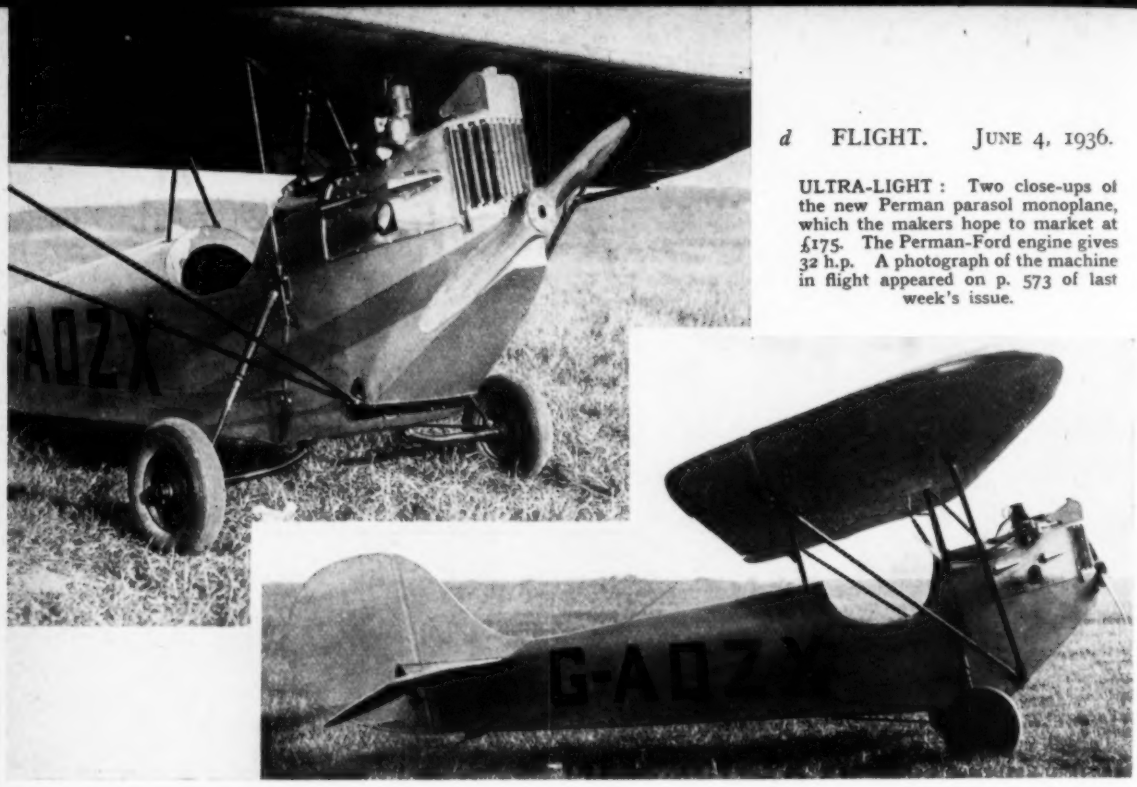




(Above) The sign of the triple crown : Bristol-engined Heinkel S5C and S5A floatplanes of the Second Air Corps, Royal Swedish Air Force, over Hagernäs. (*Flight* photograph.)

(Centre) A composite squadron—seen in "line astern"—of three Bristol Bulldogs and six Jaktfalt machines from the Swedish First Air Corps at Västeras. (*Flight* photograph.)

(Below) Mr. E. H. Alliot, a Brooklands instructor, demonstrating to pupils with a model of the aerodrome he has built to indicate the best directions for taking off and landing.



ULTRA-LIGHT : Two close-ups of the new Perman parasol monoplane, which the makers hope to market at £175. The Perman-Ford engine gives 32 h.p. A photograph of the machine in flight appeared on p. 573 of last week's issue.

Here and There (*continued*)

Aircraft Gears

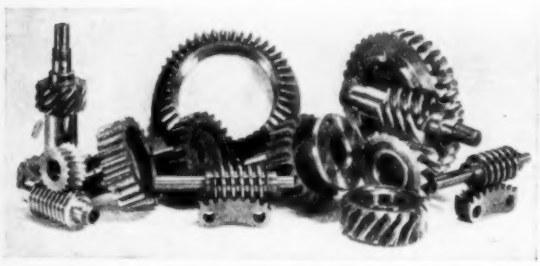
THE demand for aircraft gears has in recent years called for considerable research work in the methods of manufacture and the development of special machines for this purpose.

The experience of David Brown and Sons (Hudd), Ltd., Huddersfield, in the manufacture of all types of gearing, together with the facilities of their metallurgical, research and testing laboratories, have enabled them to keep in the forefront among manufacturers of this class of product.

Where the ratio of strength to weight is so important, success depends on the correct selection and heat treatment of the materials and the uniform distribution of loads. On gear teeth this distribution can only be accomplished by the utmost accuracy in manufacture, which, in the case of the concern under review, has entailed the careful designing, building and maintaining of special machines.

Tooth profile grinding, however accurate, is not alone sufficient, and must be followed by careful burnishing and lapping. Only by these special means can localised stresses be avoided and the highest possible efficiency obtained.

The illustration shows a typical group of aircraft gears, the bronze worm wheels being particularly interesting, as, for this class of gear, castings have always been viewed with suspicion owing to the possibility of hidden defects which might be disastrous with gears of such light section. In the case of David Brown's centrifugally-cast " Taurus " bronze this doubt has definitely been removed, and, it is stated, these gears have been proved reliable and efficient in long and strenuous service. In this direction, the exceptional experience of the company in the manufacture of worm gearing for automobile transmissions embodying their patent form of thread has been of great value.



Super-finish : A typical batch of aircraft gears from the David Brown factory.

Why Wire Weakens

ENTITLED "Fatigue of Wire," a most interesting little handbook has been produced by Bruntons, Ltd., Musselburgh, Scotland, who are manufacturers of wire and wire rope. Their descriptions of test processes should be of considerable value to all who are interested in the subject.

Seeing Belgium

THE Second Aerial Tour of Belgium has been arranged for the period between July 2 and 5. This tour will start at Antwerp and finish at Le Zoute, and the entrance fee, including accommodation expenses, is 250 Belgian francs—about 35s. at the present rate of exchange.

The route will include places such as Eindhoven (Holland), Chateau d'Ardennes and Gosselies, where stops will be made, and the entrants will be the guests of the clubs concerned. Further information can be obtained from the offices of the "2e Tour Aerien-Belgique, 1936," Place Léopold, 11, Antwerp, Belgium.

A Laboratory Review

AN interesting new monthly publication which has recently appeared is the *Philips Technical Review*. It is chiefly devoted to detailed accounts of the work done in the Philips Research Laboratories. The first issue contains, among other things, articles on the application of X-rays for the examination of materials, an investigation of the fusing of welding electrodes, a dissertation on relay valves as timing devices in seam welding practice, a review of modern high-voltage testing equipment, and a study of sodium and mercury vapour lamps.

The *Review* is obtainable from Philips Lamps, Ltd., 145, Charing Cross Road, London, W.C.2.

Busk Studentship in Aeronautics

IT is announced that a vacancy has arisen for the Busk Studentship in Aeronautics for the year 1936-7. Established in memory of Edward Teshmaker Busk, who in 1914 lost his life while flying an experimental aeroplane, the studentship is of the value of about £150, tenable for one year from October 1, though a student may be reappointed on the same terms for a second year. It is open to any man or woman who is a British subject and of British descent, and who has not attained the age of twenty-five on October 1 next. Its object is to enable the holder to engage in research in aeronautics and specially in those subjects, such as stability problems, meteorological questions bearing on flight, and the investigation of gusts, in which Edward Busk was specially interested.

The trustees hope to make an appointment during July next, and applications must be made before June 15. Full particulars are obtainable from Professor B. Melvill Jones, Engineering Laboratory, Cambridge University.

HERE and THERE *(Continued)*

A London-Johannesburg Race

MR. I. W. SCHLESINGER, the South African industrialist, who controls some seventy companies chiefly concerned with theatres, films, and insurance, has given £10,000 as prize money for an air race from London to Johannesburg, to start on September 15 next, the day on which the Johannesburg Empire Exhibition is to be opened.

The Royal Aero Club has agreed to organise the race, which will be a handicap, with a special prize for the machine making the fastest time. The handicaps are expected to take account of commercial qualities in the aircraft. The course will lie through Cairo, Nairobi, and Salisbury (Rhodesia), and will be about 7,000 miles in length. There will probably be four controls at which landings will be compulsory, with other permissible landing places. The race will be confined to aircraft and pilots of the British Empire, and has the approval of the Air Ministry and the Union Government. Editorial comment on the subject appears on page 590.

The Hungarian Tour

THE annual Hungarian air tour, known as the Magya Pilota Pic Nic, starts on June 13 at Siofok, on Lake Balaton. The route, which is not exactly the same as that of last year, will run by way of Pécs, Mezöhegyes, Debrecen, Hortobágy, and Budapest.

The leader of the Hungarian party will be H.R.H. the Archduke Albrecht.

Participants are warned against flying across the prohibited area to the north of Lake Balaton. The Shell people will be in charge of the fuelling arrangements at the various aerodromes, so pilots should carry their Shell carnets.

The O.U.A.S. Entertains

WHEN Wing Commander C. N. Lowe and Prince A. Obolensky are seen dining at the same festive board, the casual visitor might be excused if he concludes that the occasion of the gathering is a discussion on "How to play right wing three-quarter for England" by two of the most eminent persons who have ever held that position. Then, catching sight of Mr. Sciortino and Flight Lieuts. E. T. C. and H. R. A. Edwards, the visitor might think there was something more watery about the gathering, and might prick up his ears to hear if the guests from Cambridge were muttering anything about the "Home of Lost Causes."

But all such speculations last Friday would have been wrong. That evening the greatest luminaries of the University, the Cabinet, the Air Council, and other distinguished bodies were assembled at Manor Road, Oxford, as the guests of the Oxford University Air Squadron. The order in which those august bodies are mentioned is no insult to the one placed second, for both Lord Swinton and Sir Philip Sassoon (though the latter was unavoidably absent) are Oxford men. In short, this was a very notable gathering.

The speeches were worthy of the occasion. Wing Cdr. Lowe, Chief Instructor of the O.U.A.S., stirred everyone by his summons to Oxford men to take their share in securing the safety of their country. The next war (if ever it came) would, he prophesied, be like a fifty-yards race, in which no one could give a start to anyone else. He asked the members of the Air Squadron candidly if they were fit to take their places in squadron work. What did they know, beyond simple flying on a school machine? He urged them to apply for commissions in the R.A.F., the Auxiliary Air Force, or in the R.A.F. Reserve.

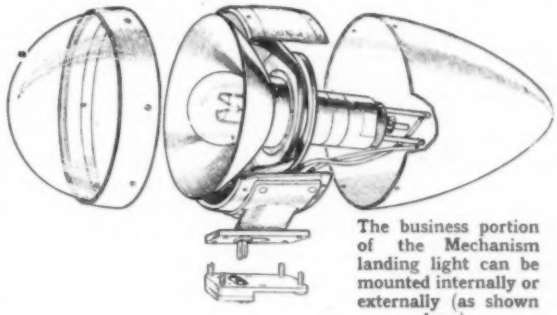
Lord Swinton, Secretary of State for Air, began with his expected witticisms—and very highly enjoyed they were—and went on in very serious strain to describe the problems of expanding the Air Force and arranging for supplies of aircraft and engines. What we were doing to-day was the greatest insurance of peace, and everyone in the country, whatever his views, could and should take a part in it. He, too, called on Oxford to help in promoting the cause of peace.

From talk of world politics the company was then lifted to the plane of purest wit and humour by Col. C. H. Wilkinson, M.C., the Dean of Worcester College. Proposing the health of the Air Squadron, he asked how it could expect any blessings, when the first Lord of the Air had been Lucifer, and his assistant Beelzebub—positions which were now held by Lord Swinton and Sir Philip Sassoon. Wing Commander after Wing Commander reported well on the O.U.A.S., but what manner of men were these Wing Commanders? Park and Lowe, Park and Lowe—it sounded like soft music or a poem by Tennyson. And so on, until at last the party did drink the health of the Air Squadron, and Mr. R. C. Stanley-Baker, speaking, as he said, with the voice of the rabble, gracefully returned thanks.

Accessories from Croydon

AN accessory which met with widespread success immediately after its introduction was the Demec tricolour navigation light, which was described in *Flight* of December 13, 1934. Now the firm of Mechanism, of 6a, George Street, Croydon, Surrey, who introduced it, have produced a new version. Although of similar luminosity, its size and weight are only half those of the original model. It is necessary to undo only one screw to dismantle the parts.

This light (or, more correctly, trio of lights) was only one of the items which *Flight* saw on a recent visit. One of the newest of the company's products is an artificial horizon weighing only 1¾ lb. It will register a complete roll and requires a comparatively small venturi. Every part of this horizon is made by Mechanism except the ball bearings. A production batch is now going through the shops.



The business portion of the Mechanism landing light can be mounted internally or externally (as shown here).

Yet another item was a clock weighing about 6 oz. and provided with a time-of-flight hand and a second hand working from the centre. It is wound from the face.

There was also a landing light which can be mounted internally or externally on an aircraft. It is of the 12-volt type and weighs but 3¼ lb. The beam may be arranged to shine in any required direction.

Forthcoming Events

June 6. Official Opening of Gatwick Airport.
June 6-14. Czechoslovakia Aero Club: Tour.
June 7. London Air Park Club: Hanworth Garden Party.
June 13-14. Opening of Brighton Hove and Worthing Airport: International Rally.
June 13-19. Hungarian Pilota Pic-Nic.
June 27. Royal Air Force Display, Hendon.
July 2-5. Belgian Aviation Clubs: Tour Aerien Belgique.
July 10 and 11. R.Ae.C.: King's Cup Race.
July 18. Portsmouth Aero Club: Isle of Wight Race.
July 23-26. R.Ae.C. Week-end Aerien.
August 1. Cinque Ports Club: Folkestone Trophy Race.
August 1-3. Yorkshire Gliding Club: Open Meeting.
August 2-15. Yorkshire Gliding Club: Instruction Camp.
August 3. Ramsgate Airport: *Pou-du-Ciel* Race.
August 8. Reading Aero Club: Northesk Cup Competition for Women Pilots.
August 15-30. Yorkshire Gliding Club Open Meeting and Competitions.
August 22. Midland Aero Club: "At Home" and Contact Air Race.
August 29-30. Cinque Ports Club: International Rally and Wakefield Cup Race.
August 29-Sept. 6. British Gliding Association: Annual Competition, Gt. Hucklow, Derbyshire.
August 30. Gordon Bennett Balloon Race, Poland.
September 5-6. Aero Club of Hungary: Week-end Aerien.
September 12. London Aeroplane Club: Hatfield Garden Party.
September 13. Aero Club de France: Coupe Deutsch Race.
September 20. London Air Park Club: Display.
October 25. Aero Club de France: Saigon Race.
November 13-29. Fifteenth International Aero Exhibition, Paris.

MODERN AIRPORT

Features of Gatwick, London's Latest Terminal : Rational Building Layout : Ground and Air Traffic Control : Ancillary Services

Illustrated by "Flight" Photographs

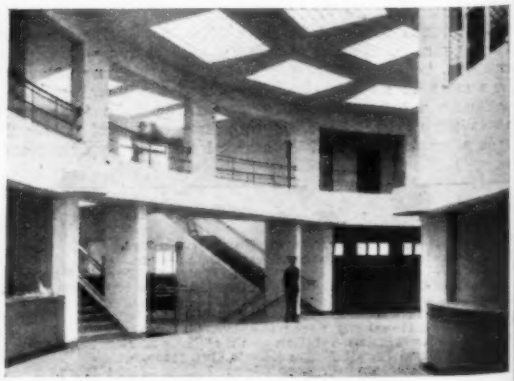
IT is not often that we have a chance of seeing what can be done in the matter of terminal airport design when those who are responsible for the work are able to start right from the foundations. The majority of airport owners and tenants must necessarily make the best of something which may have been planned and laid out long before modern needs and conditions had been visualised.

Although there has been an aerodrome at Gatwick for a number of years, so many additions have been made that the real Gatwick Airport, which is to be opened on Saturday by Lord Swinton, the Secretary of State for Air, may be considered as entirely new. More than that, since it has been laid out for the use of more air traffic than we are likely to see for several years, it may be said to be futuristic—in the exact sense of the word and not to suggest that it is in any way bizarre.

Gatwick is the ideal airport so far as ideals can be brought into line with architectural and financial problems. The traffic arrangements alone should be capable of dealing with any increases likely to appear during the next decade, and the terminal building is such that any increase in the number of passengers and in the quantity of goods can be dealt with by a mere increase in operating personnel. As the entire southern section of the airport is laid out only for the ground movement of aircraft, there is no limit, within reason, to the number of hangars and other buildings which may be erected in that area. For the present, only those hangars which are for immediate use are to be found, but others can be erected as the demand appears.

From the point of view of the passengers, Gatwick has certain advantages in the matter of surface travelling comfort, and, though farther from London's centre than either Croydon or Heston, the time taken to reach it by Southern Railway electric train compares favourably with that given in time-tables by the various companies operating from other terminals. So far as Continental services are concerned, its position enables some small but important saving in flying expenses to be made.

The fact that one important airline company, British Airways, has already made Gatwick its permanent head-



Simple in conception, the interior architecture of the terminal building is made all the more effective by its shape. On the left is British Airways' traffic counter —with scales! The picture which forms the heading is of the interior of the control "tower."

The general appearance of the terminal building with its retractable gangways is well shown in this view. A British Airways' D.H.86 has just come in from Scandinavia.

quarters has tended to cause a very important function of the airport to be overlooked by the general public. Lying south of the Surrey hills and outside London's fog area, it makes an ideal alternative airport to be used either when Croydon is impossible, or when it is so bad that pilots are likely to have to wait a long time for their landing turn.

For the present, at least, Gatwick lies in Heston's area, and the London-Continental area has, as explained in last week's issue, been modified to suit the situation. When conditions warrant it there will be a five-mile controlled zone around the airport, and Flt. Lt. W. E. Simmonds, the chief control officer, or Sqn. Ldr. St. John, his assistant, will eventually be in direct telephonic communication with Heston. In due course, too, Gatwick may have its own short-range direction-finding station. There should be no difficulties in this, as the short-range Southampton station is now working quite well in spite of the proximity of the Portsmouth main station. However, the details of this equipment and of the expected short-wave approach beacon are still undecided, and, for the moment at any rate, all that can be said is that the Marconi Wireless Telegraph Company have sensibly planned for the future to the extent of opening a special wireless service station in the main building.

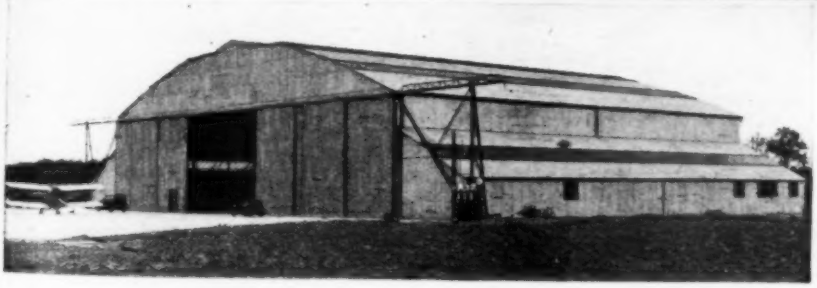
With a circulatory traffic system, ground control presents few difficulties. Machines taxy in on their right, encircle the terminal building until they reach the specific gangway for the use of their passengers, and then carry on in a left-handed circuit into the hangar or out on to the aerodrome again. If necessary, it should be possible to deal with a machine every minute without congestion and without risk of minor ground collisions. Three of the six extensible covered gangways are used for the arrivals and three for the departures. The place of the seventh gangway is virtually taken by the subway leading to Gatwick Airport station.

As far as airport buildings, at least, are concerned, the Martello air station is unique, the circular structure graduating from one storey at the outside to four stories in the centre, where the control offices and the like are arranged. On the ground floor the outer circle is devoted to Customs, stores, and freight departments, the next, working inwards, to offices, while the inner concentric space is, apart from the central block, an assembly hall. The floor above is devoted to the administrative work, with a restaurant and balcony, from which a view of the entire aerodrome can be obtained. The entire building is extremely low in height and very compact without being cramped.

The Nerve Centre

From their glass-encased office at the apex of the building the control officers have a perfect view in all directions, and the only part of the landing ground, or taxying area, which is out of their sight is that which comprises the western extension; this is hidden by trees. Work on the landing areas and runways is now almost complete, though it will be many months before the grass is growing everywhere. In a year's time everything will have settled down and the airport will probably be one of the showplaces of its kind. All the work on the ground itself has been carried out by En-Tout-Cas (Syston), Ltd., and the landing runs will eventually vary from 1,000 to 1,200 yards.

Full night-landing equipment is already installed and in working order and consists of three weather-protected floodlights (installed by Chance Bros., Ltd., of Smethwick, Birmingham), each of 1,500,000 candle-power, one or two of which can be used according to the direction of the wind, and a landing tee, boundary lights, neon beacon



On the left is the hangar which is occupied by Air Travel, Ltd., while above is British Airways' hangar and operational offices.

The restaurant, from which passengers and visitors have a clear view of most of the landing area.

and tower, obstruction lights, and all the necessary cables and switchgear, installed by the General Electric Co., Ltd., of Magnet House, Kingsway, London, W.C.

Most of the actual building work has been carried out by A. Jackaman and Sons, of Slough, while A. and J. Main and Co., Ltd., of Vincent House, Vincent Square, London, S.W.1, have also played a very large part in the construction of the hangars and have provided the necessary steelwork for the terminal building itself. At present there are two large hangars and another smaller one which has been divided into twenty lock-ups for the use of private owners. One, used by Air Travel, Ltd., has a clear floor space of 150 feet with a single Mansard-type girder above the doors, which allow 30 feet of clear space to the eaves.

A double-span building at the southern end of the ground has a frontage of 300 feet, and the sixteen-leaf doors open to the full width. Brick is used to cover the main framework of the workshop section of this hangar.

Returning again to the terminal building, this is built in reinforced concrete finished with artificial stone, and the whole of the interior has been very tastefully decorated and furnished by Reens-Arta, of 4, Berkeley Street, London, W.1. The effect is one of simplicity, but such an effect demands a good deal more study than might be imagined. Mrs. Arnold, the managing director of this company, has had a good deal to do with the general design of the building from the æsthetic point of view. Drytone Joinery, Ltd., of 60, Arlington Road, London, N.W.1, were responsible for much of the special woodwork in this interesting building, which, incidentally, is air-conditioned.

As the amount of traffic increases the problem of quick refuelling becomes more important, and it is interesting to notice that, in addition to the normal underground storage equipment, a mobile unit is also being used. Both have been supplied by Thompson Bros. (Bilston), Ltd.

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In charge at Gatwick: Flt. Lt. W. E. Simmonds, chief control officer, and Sqn. Ldr. St. John, assistant control officer.

Gatwick Airport, in fact, shows every indication of being, in time, one of the most important and well-run in the country. Airports, Ltd., can hardly expect it to show its true potentialities even within a year, but a start has now been made.

TWO ENTERTAINING BOOKS

From Box-kites to Bombers, by George Fyfe. John Long, 16s.

TO give an objective review of this book is difficult; perhaps the most accurate summary that one can make is to say that it lives up to its title. The author starts with the "box-kites" of the pioneers and takes his readers through the stages of aircraft development to the present day, with a peep at the future thrown in for good measure. But the book is no dust-dry history. Mr. Fyfe, once an officer in the R.F.C. and R.A.F., is a Fleet Street journalist, and he writes in the newsy, meaty, incisive fashion which that statement implies. His book is "popular" in style, yet avoids the "popular" inanities. The author does not present the bare historical structure; instead, he embellishes it with entertaining facts, anecdotes and what, for want of a better term, one might call "snippets." The pilots of 1914 who hurled hand-grenades at each other; R.F.C. pilots who decorated the livestock of a French farmyard with squadron markings, and tried to teach the ducks formation flying; by contrast, the sufferings of German airship crews raiding England at 20,000 feet in winter; literally hundreds of such varied incidents form material for Mr. Fyfe's pen.

Discussing the omnipotence of the modern bomber (he quotes Lord Trenchard's "while the aeroplane is the most offensive weapon that has ever been invented, it is a shockingly bad weapon of defence") he ends thus: "Only the other day we learned to fly. We were concerned then with the problem of supporting a heavier-than-air machine in flight. We conquered the air. The problem now is to see that it does not conquer us. How ironical a sequel!"

Stormy Petrel, by Charles Kennett. Hurst and Blackett, 10s. 6d.

PROVIDED the reader is not sensitive to *clichés*—to telephones that shrill, to brief colloquies that ensue, and to a hero to whom it is the work of a moment to mix a stiff drink—there is a lot of good entertainment in this allegedly true autobiography of a rolling stone who gathered quite a lot of moss, mainly from other people.

He goes to America and acts as pilot to gangsters on the Mexican border, smuggling dope in a Liberty-engined S.E.5 and Chinese in a Curtiss Condor; temporarily reforms, and becomes a U.S. Air Mail pilot; joins the U.S. Army Air Corps, but absconds in a Curtiss Oriole to China; flies for the revolutionary Sun Yat Sen; gets posts as airline pilot, and then as a golf professional in Australia; goes back to America and runs a motor boat for bootleggers; and finishes up in England as a lorry driver. These adventures are linked by journeys in the stokeholds of ships and under freight-cars on railroads. In short, the tale of a Tough Guy.

of England of persons who have served as officers or airmen in the Royal Air Force. The Reverend J. J. Case, The Rt. Hon. Sir Samuel J. G. Hoare, Bt., G.C.S.I., G.B.E., C.M.G., M.P., and the Chaplain-in-Chief of the Royal Air Force are the trustees of the fund. The extent of the assistance which can be given at present is limited by the size of the income of the fund supplemented twice a year by collections at church parade services. The trustees will gladly welcome donations to the fund which may be forwarded to the Chaplain-in-Chief at the Air Ministry.

Enquiries in regard to grants from the Case Trust Fund should be addressed to the Secretary, Air Ministry, Kingsway, W.C.2.

BERTRAND STEWART PRIZE ESSAY

The subject for the Bertrand Stewart Prize Essay (for particulars see *Army Quarterly*) for 1937, is as follows:—

"Discuss the reorganisation of the Territorial Army in the light of modern developments, such as the air menace to this country and mechanisation."

ROYAL AIR FORCE GAZETTE

London Gazette, May 26, 1936

General Duties Branch

The following Pilot Officers on probation are confirmed in rank (April 30):—E. F. E. Barnard, D. O. Finlay, W. W. Loxton, N. F. Simpson, K. G. Stodart.

Acting Pilot Officer on probation C. G. Masters is confirmed in rank and graded as Pilot Officer (April 16).

The following Acting Pilot Officers on probation are graded as Pilot Officers on probation (April 16):—M. Beckett, A. G. F. Cuningham, C. F. Darbishire, R. N. Keeble, P. A. M. Stickney.

Wing Cdr. D. Colyer, D.F.C., is granted the acting rank of Group Captain (unpaid) (May 21).

The following Flying Officers are promoted to the rank of Flight Lieutenant with effect from the dates stated:—B. A. Fraser (April 1); T. C. Chambers (May 9).

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Sqn. Ldr. J. Cottle, M.B.E., D.F.C., ceases to be seconded for duty with the Egyptian Government (May 21); Flt. Lt. H. M. Pearson ceases to be seconded for duty with the Peruvian Government (May 19); Lt. W. L. Mayo, R.N., Flying Officer, R.A.F., ceases to be attached to the Royal Air Force on return to Naval duty (April 18); Flt. Lt. L. G. Martin is transferred to the Reserve Class A (May 8).

The short service commissions of the following Acting Pilot Officers on probation are terminated on cessation of duty on the dates stated:—D. A. V. John (May 15); F. P. H. Dufton (May 20).

Medical Branch

The following are granted short service commissions as Flying Officers with effect from May 4 and with seniority of the dates stated:—J. R. R. Jenkins, V. D. Jones (May 4, 1935); R. M. Outfin (July 27, 1935); J. H. Neal, R. H. Pratt, D. G. Smith (November 4, 1935); S. G. Gordon (November 23, 1935); J. C. Bowe (February 4); G. P. Jones, J. G. Rountree (May 4).

The commission of F/O. R. F. Courtin is antedated to September 2, 1935, and he ceases to be seconded to the Royal Victoria and West Hants Hospital with effect from April 30.

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

General Duties Branch

A. F. Ingram is granted a commission as Flight Lieutenant in Class C (April 20); F/O. C. Byron is transferred from Class A to Class C (May 22); F//O. J. H. Gresham is transferred from Class AA(ii) to Class C (May 26); Flt. Lt. F. H. Dight is transferred from Class BB to Class C (July 31, 1935).

The following Flying Officers are transferred from Class C to Class A on the dates stated:—I. G. Ross (May 1); R. A. Dimsdale (May 6).

The following Flying Officers relinquish their commissions on completion of service and are permitted to retain their rank (May 1):—H. J. Ellam, D. M. David.

Flt. Lt. E. J. N. Heaven relinquishes his commission on appointment to a commission on the Unattached List for the Indian Army (April 18); the commission of Flying Officer on probation M. H. Fitzgerald (Lt. East Yorks Regt., R.A.R.O.) is terminated on cessation of duty (March 8); the notification in the *Gazette* of July 30, 1935, concerning F/O. A. N. I. Worger-Slade is cancelled.

AUXILIARY AIR FORCE

General Duties Branch

No. 608 (NORTH RIDING) (BOMBER) SQUADRON.—The Right Honourable Viscount Swinton, G.B.E., M.C., is appointed Honorary Air Commodore (May 12).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Squadron Leader.—C. Boumphrey, D.F.C., to No. 1 School of Technical Training (Apprentices), Halton; for Administrative duties in No. 2 Apprentices Wing, 19.5.36.

Flight Lieutenants.—J. A. Hawkings, to Experimental Section, Royal Aircraft Establishment, South Farnborough, 18.5.36. H. M. Mellor, to No. 810 (F.T.B.) Squadron, 11.5.36. R. K. Brougham, to Electrical and Wireless School, Cranwell, 25.5.36. W. E. Cameron, to No. 25 (F) Squadron, Hawkinge, 19.5.36.

Flying Officers.—R. T. Gething, to School of Air Navigation, Manston, 18.5.36. T. G. Young, to School of Army Co-operation, Old Sarum, 1.5.36. W. P. Harvey, to No. 10 Flying Training School, Tern Hill, 18.5.36.

Pilot Officers.—C. R. Hart, to No. 214 (B) Squadron, Andover, 19.5.36. E. G. Campbell-Voullaire, to No. 4 (Army Co-operation) Squadron, South Farnborough, 19.5.36. A. C. Brown, to School of Army Co-operation, Old Sarum, 30.4.36. R. N. Smith, to R.A.F. Station, Farnborough, 1.5.36.

Acting Pilot Officers.—M. W. Hamlyn, to No. 57 (B) Squadron, Upper Heyford, 23.4.36. P. White, to School of Air Navigation, Manston, 23.4.36. W. J. L. Stevenson, to No. 2 Armoured Car Company, Ramleh, 16.5.36.

The undermentioned are posted to No. 10 Flying Training Depot, Tern Hill, with effect from 16.5.36:—R. M. Blennerhassett, W. B. G. Bonsey, H. L. M. Bulloch, D. O. Butler, W. P. Cambridge, W. H. Cheetham, J. W. E. Davies, I. P. Grant, A. B. Creenaway, D. J. Gudgeon, G. R. G. Henderson, M. F. Hendry, D. J. How, P. H. M. S. Hunt, A. P. G. Hyde, N. L. Ievers, R. C. O. Lovelock, E. W. Mitchell, P. D. F. Mitchell, G. E. Newton, J. R. Pennington-Legh, F. Phillips, B. J. Rogers, R. H. Sleigh, H. J. A. Thewles, J. N. de M. Tyrrell, E. R. D. Vaughan, W. R. D. Watkins-Lewis, and A. G. Wincott.

The undermentioned are posted to the Royal Air Force Depot, Uxbridge, on appointment to short service commissions as Acting Pilot Officers on probation, with effect from May 4, 1936:—G. V. Aylott, L. M. Beavis, J. L. Beck, R. M. Blennerhassett, W. B. G. Bonsey, H. L. M. Bulloch, T. A. Bunting, D. O. Butler, W. P. Cambridge, W. H. Cheetham, P. Corbishley, S. F. Coutts-Wood, C. A. R. Crews, J. W. E. Davies, C. D. Fox, G. E. French, W. R. Gardiner, K. M. Gillies, I. R. Gleed, I. P. Grant, A. B. Greenaway, D. J. Gudgeon, G. R. G. Henderson, M. F. Hendry, D. J. How, E. A. Hunt, P. H. M. S. Hunt, B. O. Huxtable, A. P. G. Hyde, N. L. Ievers, P. G. Jameson, D. I. Jobson, G. C. O. Key, T. W. Lamb, R. C. O. Lovelock, W. M. Lupton, A. N. Macfarlane, E. W. Mitchell, P. D. F. Mitchell, R. A. G. Morgan, J. F. Newman, G. E. Newton, G. K. Peacock, J. R. Pennington-Legh, F. Phillips, R. D. E. Pitcairn, H. F. Plank, B. J. Rogers, L. G. Schwab, W. T. Scott, R. H. Sleigh, N. J. Starr, J. F. Sutton, H. J. A. Thewles, J. N. de M. Tyrrell, E. R. D. Vaughan, R. N. Wall, W. R. D. Watkins-Lewis, A. G. Wincott, and G. S. Woodwark. P. R. Walker, to No. 1 (F) Squadron, Tangmere, 11.5.36. J. Butterworth and C. B. E. Burt-Andrews, to No. 2 (Army Co-operation) Squadron, Hawkinge, 11.5.36. A. J. Robinson, to No. 4 (Army Co-operation) Squadron, South Farnborough, 11.5.36. R. K. Wildey and P. H. Reybeck, to No. 7 (B) Squadron, Worthy Down, 11.5.36. P. Hadfield, to No. 13 (Army Co-operation) Squadron, Old Sarum, 11.5.36. D. D. Rawlins, to No. 16 (Army Co-operation) Squadron, Old Sarum, 11.5.36. J. T. Webster, to No. 17 (F) Squadron, Kenley, 11.5.36. J. L. Crisp, to No. 18 (B) Squadron, Bircham Newton, 11.5.36. A. D. Annand, to No. 26 (Army Co-operation) Squadron, Catterick, 11.5.36. F. E. Rosier, to No. 43 (F) Squadron, Tangmere, 11.5.36. W. Riley, to No. 54 (F) Squadron, Hornchurch, 11.5.36. G. H. F. Plinston, to No. 56 (F) Squadron, North Weald, 11.5.36. G. C. Hyde, to No. 58 (B) Squadron, Upper Heyford, 11.5.36. B. J. Sandeman, to No. 98 (B) Squadron, Abingdon, 11.5.36. M. W. B. Knight, to No. 111 (F) Squadron, Northolt, 11.5.36. B. Bell, W. H. Biddell, E. J. Brooks, B. E. Dobb, C. E. Drapper, M. A. L. S. Giles, and J. M. H. Sinclair, to School of Air Navigation, Manston, 11.5.36. P. D. D. Carlton, A. Hibberd, T. F. D. Morgan, H. W. Tennant, and J. S. Tupholm, to R.A.F. Station, Gosport, 11.5.36. G. C. N. Close and I. A. Fergusson, to No. 16 (Army Co-operation) Squadron, Old Sarum, 6.5.36.

Stores Branch

Wing Commander.—W. C. Clark, to D. of E., Dept. of A.M.S.O., Air Ministry, 20.5.36.

Squadron Leader.—S. Bingham, to Home Aircraft Depot, Henlow, 13.5.36.

Flying Officer.—L. H. Anness, A.F.C., to No. 2 Stores (Ammunition) Depot, Broadheath, 25.5.36.

Medical Branch

Wing Commander.—A. F. Rook, to Central Medical Establishment, London, for duty as Consultant in Medicine, 18.5.36.

Squadron Leaders.—J. Magner, to R.A.F. Hospital, Cranwell; for duty as Medical Officer, 18.5.36. R. G. Freeman, to R.A.F. Depot, Uxbridge; for duty as Medical Officer, 21.5.36.

Flying Officers.—J. C. Bowe, S. G. Gordon, J. R. R. Jenkins, G. P. Jones, V. D. Jones, J. H. Neal, R. M. Outfin, R. H. Pratt, J. G. Rountree, and D. G. Smith, to Medical Training Depot, Halton, on appointment to short service commissions with effect from 4.5.36.

The restaurant, from which passengers and visitors have a clear view of most of the landing area.

and tower, obstruction lights, and all the necessary cables and switchgear, installed by the General Electric Co., Ltd., of Magnet House, Kingsway, London, W.C.

Most of the actual building work has been carried out by A. Jackaman and Sons, of Slough, while A. and J. Main and Co., Ltd., of Vincent House, Vincent Square, London, S.W.1, have also played a very large part in the construction of the hangars and have provided the necessary steelwork for the terminal building itself. At present there are two large hangars and another smaller one which has been divided into twenty lock-ups for the use of private owners. One, used by Air Travel, Ltd., has a clear floor space of 150 feet with a single Mansard-type girder above the doors, which allow 30 feet of clear space to the eaves.

A double-span building at the southern end of the ground has a frontage of 300 feet, and the sixteen-leaf doors open to the full width. Brick is used to cover the main framework of the workshop section of this hangar.

Returning again to the terminal building, this is built in reinforced concrete finished with artificial stone, and the whole of the interior has been very tastefully decorated and furnished by Reens-Arta, of 4, Berkeley Street, London, W.1. The effect is one of simplicity, but such an effect demands a good deal more study than might be imagined. Mrs. Arnold, the managing director of this company, has had a good deal to do with the general design of the building from the æsthetic point of view. Drytone Joinery, Ltd., of 60, Arlington Road, London, N.W.1, were responsible for much of the special woodwork in this interesting building, which, incidentally, is air-conditioned.

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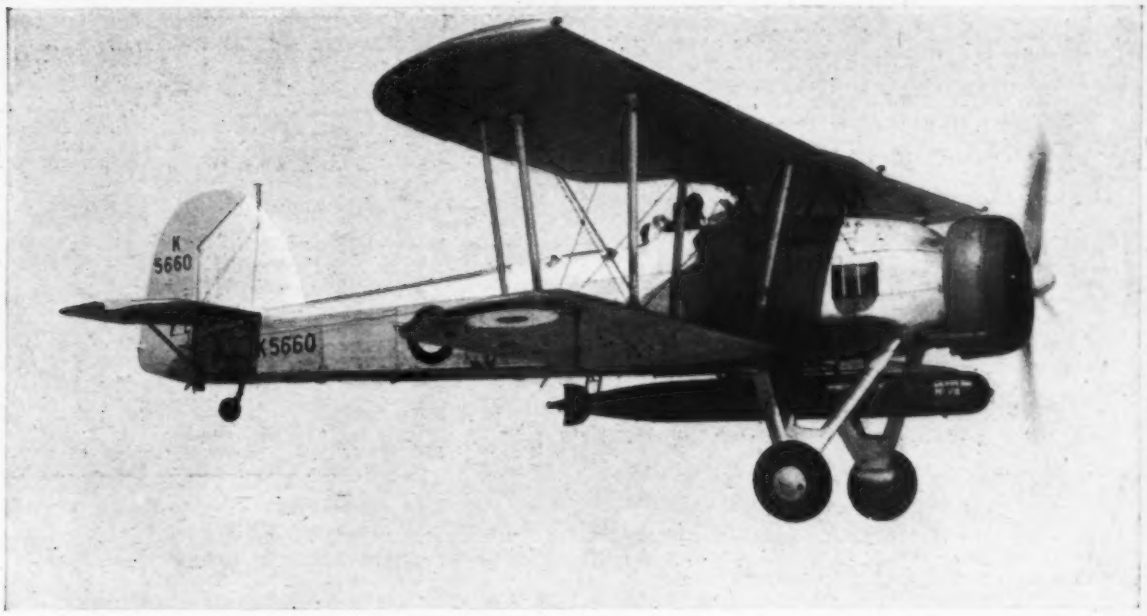
THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS — AIR MINISTRY ANNOUNCEMENTS



THE FIRST SYMBOL. The "T" in "T.S.R." stands for "torpedo," "S" and "R" for "spotter" and "reconnaissance" respectively. Within the T.S.R. category comes the Fairey Swordfish (Pegasus III) seen here over Martlesham complete with "tin fish."—(*Flight* photograph.)

R.A.F. DISPLAY—ADMISSION

Service Personnel.—R.A.F. personnel serving at home and personnel on leave from abroad, reserve officers, airman pilots of Class "F," R.A.F. Reserve, officers and airmen of the Special Reserve and of the Auxiliary Air Force, R.A.F. pupil pilots at civil flying schools, and also members of Princess Mary's R.A.F. Nursing Service, are each entitled, subject to the succeeding sub-paragraphs, to free admission for themselves and one guest, as follows:—

Rank.	*Entitlement.*
(*a*) Officers, cadets and members of Princess Mary's R.A.F. Nursing Service (whether in uniform or plain clothes).	Two tickets, which entitle the holders to free admission to the 10s. enclosure.
(*b*) Warrant officers, and N.C.Os. of, and above, the rank of sergeant and airman pupil pilots at civil flying schools (whether in uniform or plain clothes).	Two tickets, which entitle the holders to free admission to a 5s. enclosure.
(*c*) Airmen of, and below, the rank of corporal, and aircraft apprentices (uniform compulsory).	Free admission to a 2s. enclosure without ticket. Also one free 2s. enclosure ticket for the use of one guest.

Service personnel engaged on duty at the Display are each entitled to tickets of free admission for two guests. Service personnel at home who, for service reasons, are unable to attend the Display, but whose relatives desire to do so, are entitled to two tickets of free admission. Service personnel stationed abroad whose relatives at home desire to attend the Display are entitled to two tickets of free admission (which are issuable only in response to applications from the relatives themselves). Applications for such tickets, supported by definite evidence as to the identity of the applicant, may be submitted as follows:—(*a*) Officers on leave from abroad and relatives of officers serving abroad—to the Secretary—Air Ministry. (*b*) Airmen on leave from abroad and relatives of airmen serving abroad—to the Officer i/c Records, Ruislip, Middlesex, who, if satisfied that the applicants are qualified, will demand tickets from the Display Secretary for them.

Regular personnel of the Royal Navy and Army or of the Dominion air forces attached to the Royal Air Force are entitled to the same privileges with regard to free and half-price admission for themselves and guests to the R.A.F. Display as personnel of corresponding ranks in the Royal Air Force.

Officers of the Reserve of Air Force Officers and airmen pilots of Class "F," R.A.F. Reserve, will receive information from the Air Ministry regarding their entitlement to free admission. The Superintendent of R.A.F. Reserve will requisition their tickets from the Display Secretary, from whom he will also requisition tickets required by R.A.F. pupil pilots at civil flying training schools.

Special Reserve officers and airmen, and officers and airmen of the Auxiliary Air Force, will obtain their tickets through their Local Service Agent.

Admission on Payment at Reduced Rates

The civilian staff of the Air Ministry, and the civilian staff and civilian employees at Air Ministry outstations, who desire to attend the Display this year may each be supplied with not more than two tickets at half the normal price of admission to the 10s., 5s., or 2s. enclosure (including admission at the entrance gates).

Officers, airmen and R.A.F. pupil pilots at civil flying schools, in addition to the free entitlement, may each be supplied with one ticket at half the normal price of admission to the enclosure as appropriate.

Members of Light Aeroplane Clubs.—The privilege of attending the Display at a reduced price of admission has again been extended to non-air force members of light aeroplane clubs, who may each be supplied with no more than two tickets for the price of one, admitting to the 10s. enclosure (including admission).

THE CASE TRUST FUND

The Case Trust Fund was formed in 1929 through the generous bequest of a sum of £5,000 by the Reverend Joshua John Case of Plymstock, Plymouth. The object of the fund is to assist the training as candidates for ordination as clergymen of the Church

of England of persons who have served as officers or airmen in the Royal Air Force. The Reverend J. J. Case, The Rt. Hon. Sir Samuel J. G. Hoare, Bt., G.C.S.I., G.B.E., C.M.G., M.P., and the Chaplain-in-Chief of the Royal Air Force are the trustees of the fund. The extent of the assistance which can be given at present is limited by the size of the income of the fund supplemented twice a year by collections at church parade services. The trustees will gladly welcome donations to the fund which may be forwarded to the Chaplain-in-Chief at the Air Ministry.

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Medical Branch

The following are granted short service commissions as Flying Officers with effect from May 4 and with seniority of the dates stated:—J. R. R. Jenkins, V. D. Jones (May 4, 1935); R. M. Outfin (July 27, 1935); J. H. Neal, R. H. Pratt, D. G. Smith (November 4, 1935); S. G. Gordon (November 23, 1935); J. C. Bowe (February 4); G. P. Jones, J. G. Rountree (May 4).

The commission of F/O. R. F. Courtin is antedated to September 2, 1935, and he ceases to be seconded to the Royal Victoria and West Hants Hospital with effect from April 30.

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

General Duties Branch

A. F. Ingram is granted a commission as Flight Lieutenant in Class C (April 20); F/O. C. Byron is transferred from Class A to Class C (May 22); F/O. J. H. Gresham is transferred from Class AA(ii) to Class C (May 26); Flt. Lt. F. H. Dight is transferred from Class BB to Class C (July 31, 1935).

The following Flying Officers are transferred from Class C to Class A on the dates stated:—I. G. Ross (May 1); R. A. Dimsdale (May 6).

The following Flying Officers relinquish their commissions on completion of service and are permitted to retain their rank (May 1):—H. J. Ellam, D. M. David.

Flt. Lt. E. J. N. Heaven relinquishes his commission on appointment to a commission on the Unattached List for the Indian Army (April 18); the commission of Flying Officer on probation M. H. Fitzgerald (Lt. East Yorks Regt., R.A.R.O.) is terminated on cessation of duty (March 8); the notification in the *Gazette* of July 30, 1935, concerning F/O. A. N. I. Worger-Slade is cancelled.

AUXILIARY AIR FORCE

General Duties Branch

No. 608 (NORTH RIDING) (BOMBER) SQUADRON.—The Right Honourable Viscount Swinton, G.B.E., M.C., is appointed Honorary Air Commodore (May 12).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Squadron Leader.—C. Boumphrey, D.F.C., to No. 1 School of Technical Training (Apprentices), Halton; for Administrative duties in No. 2 Apprentices Wing, 19.5.36.

Flight Lieutenants.—J. A. Hawkings, to Experimental Section, Royal Aircraft Establishment, South Farnborough, 18.5.36. H. M. Mellor, to No. 810 (F.T.B.) Squadron, 11.5.36. R. K. Brougham, to Electrical and Wireless School, Cranwell, 25.5.36. W. E. Cameron, to No. 25 (F) Squadron, Hawkinge, 19.5.36.

Flying Officers.—R. T. Gething, to School of Air Navigation, Manston, 18.5.36. T. G. Young, to School of Army Co-operation, Old Sarum, 1.5.36. W. P. Harvey, to No. 10 Flying Training School, Tern Hill, 18.5.36.

Pilot Officers.—C. R. Hart, to No. 214 (B) Squadron, Andover, 19.5.36. E. G. Campbell-Voullaire, to No. 4 (Army Co-operation) Squadron, South Farnborough, 19.5.36. A. C. Brown, to School of Army Co-operation, Old Sarum, 30.4.36. R. N. Smith, to R.A.F. Station, Farnborough, 1.5.36.

Acting Pilot Officers.—M. W. Hamlyn, to No. 57 (B) Squadron, Upper Heyford, 23.4.36. P. White, to School of Air Navigation, Manston, 23.4.36. W. J. L. Stevenson, to No. 2 Armoured Car Company, Ramleh, 16.5.36.

The undermentioned are posted to No. 10 Flying Training Depot, Tern Hill, with effect from 16.5.36:—R. M. Blennerhassett, W. B. G. Bonsey, H. L. M. Bulloch, D. O. Butler, W. P. Cambridge, W. H. Cheetham, J. W. E. Davies, I. P. Grant, A. B. Creenaway, D. J. Gudgeon, G. R. G. Henderson, M. F. Hendry, D. J. How, P. H. M. S. Hunt, A. P. G. Hyde, N. L. Ievers, R. C. O. Lovelock, E. W. Mitchell, P. D. F. Mitchell, G. E. Newton, J. R. Pennington-Legh, F. Phillips, B. J. Rogers, R. H. Sleigh, H. J. A. Thewles, J. N. de M. Tyrrell, E. R. D. Vaughan, W. R. D. Watkins-Lewis, and A. G. Wincott.

The undermentioned are posted to the Royal Air Force Depot, Uxbridge, on appointment to short service commissions as Acting Pilot Officers on probation, with effect from May 4, 1936:—G. V. Aylott, L. M. Beavis, J. L. Beck, R. M. Blennerhassett, W. B. G. Bonsey, H. L. M. Bulloch, T. A. Bunting, D. O. Butler, W. P. Cambridge, W. H. Cheetham, P. Corbishley, S. F. Coutts-Wood, C. A. R. Crews, J. W. E. Davies, C. D. Fox, G. E. French, W. R. Gardiner, K. M. Gillies, I. R. Gleed, I. P. Grant, A. B. Greenaway, D. J. Gudgeon, G. R. G. Henderson, M. F. Hendry, D. J. How, E. A. Hunt, P. H. M. S. Hunt, B. O. Huxtable, A. P. G. Hyde, N. L. Ievers, P. G. Jameson, D. I. Jobson, G. C. O. Key, T. W. Lamb, R. C. O. Lovelock, W. M. Lupton, A. N. Macfarlane, E. W. Mitchell, P. D. F. Mitchell, R. A. G. Morgan, J. F. Newman, G. E. Newton, G. K. Peacock, J. R. Pennington-Legh, F. Phillips, R. D. E. Pitcairn, H. F. Plank, B. J. Rogers, L. G. Schwab, W. T. Scott, R. H. Sleigh, N. J. Starr, J. F. Sutton, H. J. A. Thewles, J. N. de M. Tyrrell, E. R. D. Vaughan, R. N. Wall, W. R. D. Watkins-Lewis, A. G. Wincott, and G. S. Woodwark. P. R. Walker, to No. 1 (F) Squadron, Tangmere, 11.5.36. J. Butterworth and C. B. E. Burt-Andrews, to No. 2 (Army Co-operation) Squadron, Hawkinge, 11.5.36. A. J. Robinson, to No. 4 (Army Co-operation) Squadron, South Farnborough, 11.5.36. R. K. Wildey and P. H. Reybeck, to No. 7 (B) Squadron, Worthy Down, 11.5.36. P. Hadfield, to No. 13 (Army Co-operation) Squadron, Old Sarum, 11.5.36. D. D. Rawlins, to No. 16 (Army Co-operation) Squadron, Old Sarum, 11.5.36. J. T. Webster, to No. 17 (F) Squadron, Kenley, 11.5.36. J. L. Crisp, to No. 18 (B) Squadron, Bircham Newton, 11.5.36. A. D. Annand, to No. 26 (Army Co-operation) Squadron, Catterick, 11.5.36. F. E. Rosier, to No. 43 (F) Squadron, Tangmere, 11.5.36. W. Riley, to No. 54 (F) Squadron, Hornchurch, 11.5.36. G. H. F. Plinston, to No. 56 (F) Squadron, North Weald, 11.5.36. G. C. Hyde, to No. 58 (B) Squadron, Upper Heyford, 11.5.36. B. J. Sandeman, to No. 98 (B) Squadron, Abingdon, 11.5.36. M. W. B. Knight, to No. 111 (F) Squadron, Northolt, 11.5.36. B. Bell, W. H. Biddell, E. J. Brooks, B. E. Dobb, C. E. Drapper, M. A. L. S. Giles, and J. M. H. Sinclair, to School of Air Navigation, Manston, 11.5.36. P. D. D. Carlton, A. Hibberd, T. F. D. Morgan, H. W. Tennant, and J. S. Tupholm, to R.A.F. Station, Gosport, 11.5.36. G. C. N. Close and I. A. Fergusson, to No. 16 (Army Co-operation) Squadron, Old Sarum, 6.5.36.

Stores Branch

Wing Commander.—W. C. Clark, to D. of E., Dept. of A.M.S.O., Air Ministry, 20.5.36.

Squadron Leader.—S. Bingham, to Home Aircraft Depot, Henlow, 13.5.36.

Flying Officer.—L. H. Anness, A.F.C., to No. 2 Stores (Ammunition) Depot, Broadheath, 25.5.36.

Medical Branch

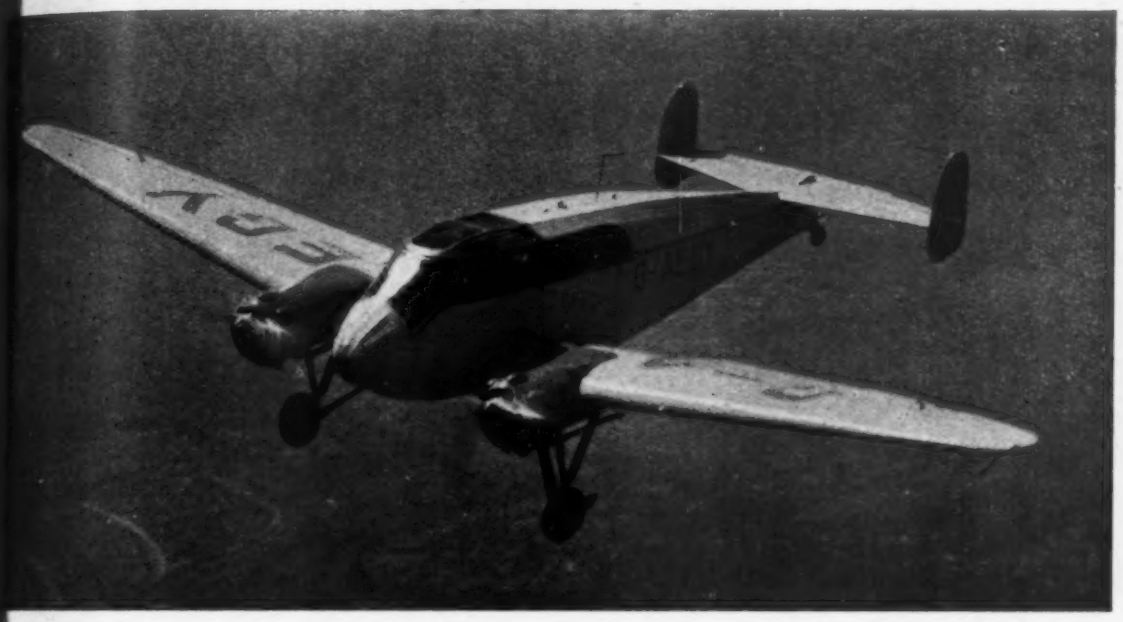
Wing Commander.—A. F. Rook, to Central Medical Establishment, London, for duty as Consultant in Medicine, 18.5.36.

Squadron Leaders.—J. Magner, to R.A.F. Hospital, Cranwell; for duty as Medical Officer, 18.5.36. R. G. Freeman, to R.A.F. Depot, Uxbridge; for duty as Medical Officer, 21.5.36.

Flying Officers.—J. C. Bowe, S. G. Gordon, J. R. R. Jenkins, G. P. Jones, V. D. Jones, J. H. Neal, R. M. Outfin, R. H. Pratt, J. G. Rountree, and D. G. Smith, to Medical Training Depot, Halton, on appointment to short service commissions with effect from 4.5.36.

MONOSPAR MODIFICATIONS

Twin Rudders and Increased Dihedral for All S.T.25 Machines : Improved Stability in All Axes



The S.T.25 in its latest form. The increase in dihedral will be noticed by those who are familiar with the machine.

FOR some time it has been known that General Aircraft were experimenting with a new form of tail for the S.T.25, and the machine in its latest form made its first public appearance at the R.Ae.S. Garden Party a little less than a month ago. To the ordinary ground spectator it was obvious only that the appearance had been considerably improved by a "strengthening" of the rear of the machine and that turns against a throttled engine could be carried out with greater ease.

In addition to the use of twin fins and rudders and of an elevator which is a complete unit, S.T.25s will, in future, have an increased dihedral. Lightly loaded, the Monospar has always been easy to fly even in very bad weather, and the modifications have been carried out largely with the idea of improving the stability in all axes when the machine is flying with an absolutely full load in the "blind" and bumpy conditions which are so often experienced in modern all-weather flying.

Single-engine Flying

The improvement is noticeable immediately the engines are opened out for the take-off. Full rudder control is available as soon as the tail has lifted, and any tendency to swing can be checked at once and without the necessity of big movements—which always tend to be persisted in after they are necessary. On the day of our trial there was a fairly high wind blowing, and the air was so very rough at lower levels that it was impossible for the newcomer to obtain any real idea of the improvements, though violent directional movements were effortlessly checked.

Once out of the very disturbed layer, however, it was possible to fly the machine quite accurately on the rudder alone, and, when correctly trimmed by means of the easily operated elevator tab, there was no further need for attention, and all minor movements were self-corrected. For some good reason that is not immediately apparent, accurate steep turns required less conscious attention, and the machine was even more noticeably stable in the glide, both when flying straight and in turns. However, unless one, so to speak, has a chance of flying the new type immediately after the old, it is impossible to speak of anything more concrete than impressions.

It is a fact, however, that turns can now be made against a throttled engine with the greatest of ease, and both the amount of rudder movement and the pressure required are surprisingly small. When flying straight on one engine, no conscious aileron correction is necessary. In production models the elevator will be heavier, so that the landing movement will require less delicate attention, and the trimming lever will be a trifle less sensitive in action.

The use of twin rudders in a bi-motor machine has a number of useful aerodynamic effects, apart from the more obvious ones resulting from the fact that the rudders are directly in the slipstreams. It may be remembered that the original Lockheed Electra had a single rudder, and experiments with twin rudders produced some interesting results.

Structurally, the changes in the new Monospar are comparatively small. Additional steadying struts have been introduced between the leading edge and the primary structure. The original finpost has been cut short above, and the ends of the tailplane are now stayed back to the tailplane spar.

Stockholm Closes

LAST Sunday saw the closing of the Aero Exhibition at Stockholm, and the British exhibitors will carry away with them the memories of a hospitable and efficient people.

Swedish hospitality is one of the few national traditions which really exists in practice, and, while it is unfair perhaps to mention only a few names, the special thanks of the British industry must be given to the City of Stockholm, the Committee of the I.L.I.S., Aeromaterials A.B., and A.B. Aerotransport. With Mr. Carl Florman as the presiding genius and Count von Bunde and Mr. Jägenbloom to settle every little query, the British industry can honestly say it was an exhibition with the bother left out.

COMMERCIAL AVIATION

AIRLINES — AIRPORTS

EUROPE'S NEWEST : An aerial view, taken by a *Flight* photographer, of Bromma Airport, Stockholm, shown in relation to the city itself. The runways are nearly completed but another hillock of solid rock, seen above the main runway, is now being blasted away. These runways measure from 800 to 1,000 metres in length. The centre of Stockholm is five miles distant and is reached by a wide road over the new Tranebergs Bridge.

THE WEEK AT CROYDON

The Whitsuntide Rush : A Sporting Double : Hysteria : International Occasions : The Irish Service

WHITSUNTIDE gave better results to air transport than might have been expected in view of the cold weather. When people realise that they are within an hour or so of brilliant sunshine they favour the use of aeroplanes.

Commercial Air Hire, for example, was extremely busy on the Whitsun Thursday and Friday, and there was no getting speech either with the pilots or staff of Olley Air Service. On the Friday there were no fewer than thirty-eight machines (including Gatwick traffic) in and out between London and Paris, and of these quite a decent proportion were fully loaded.

People were grumbling that they could not both see the Derby and go for the maiden trip of the *Queen Mary*, but most things can be managed by the intelligent use of air transport. Sir Keith and Lady Frazer saw the Derby, motored to Croydon and flew in a special Olley machine to Cherbourg, where they caught the boat. The same machine took photos of the Derby and these will, presumably, be the first to reach the U.S.

Talking of the *Queen Mary*, we are all highly delighted about her and all that, but *need* the B.B.C. interrupt the news every evening to tell us that the ship's cat has just washed her ears on C Deck? Thrilling news that "we have just passed a fish in mid-Atlantic and, what's more, it's a porpoise," later corrected to "It was *not* a porpoise but a Mr. Poore-Poise, who lost his balance and fell overboard," gets a little tiresome. Another wave of hysteria was occasioned by the fact that only one tug was required by the *Queen Mary*, and a "drama" was staged because a stowaway was discovered. What of it? It only takes one tractor to tow *Hercules* to the hangar, and stowaways have been stowed away (by publicity managers) and duly discovered on aeroplanes before now. Let us have our news bulletins interrupted also to hear an Imperial steward remark, "I am now serving Jerusalem artichokes over the very city of their origin at 6,000 feet," or a K.L.M. pilot remarking, "Five days out from Amsterdam, about to land at Batavia."

It is a curious sight to see the well-known German

Junkers Ju. 52 flying under another flag. People cannot get used to the Belgian registration marks on that which Sabena (as already reported) has been operating for a week or more. I understand that the Belgian company has acquired three of them. There are many pilots of various nationalities who maintain that few better aeroplanes, from a pilot's viewpoint, were ever built. Herr von Ribbentrop and his wife arrived at Croydon in a special Ju. 52, by the way, last Friday, went to the opera with Lord and Lady Londonderry, and, on the following day, flew on to Belfast, where they were staying a few days with Lord Londonderry, the visit being, it is said, entirely non-political. Lord Londonderry rightly flew to Belfast by Railway Air Services and not in his guests' aeroplane.

The police Autogiro, without which Derby-day traffic would become immovably wedged for a month, was at Croydon early last week having a wireless wash and brush up with Marconi's. It is an incredible creature when seen from directly behind and at some distance—but this is of small account when the machine does its job.

Olley Air Service, of which Blackpool and West Coast Air Services is a subsidiary, has been working at fever heat lately over Irish Sea Airways, the new joint Irish-English concern which, as reported in *Flight* of last week, has already commenced operations. Full loads were carried on the inaugural services in both directions. At the moment the British air terminus is Bristol, not Croydon, and this has the advantage that passengers can fill in time (dreary though train travel may be after flying) by having lunch between Bristol and London. I believe it is possible to obtain quite a fast air connection from London, via Dublin and Isle of Man, to Carlisle, and the journey should be a very interesting one. Incidentally, the first machine to be registered under Irish lettering is EI-ABI, a D.H. Dragon, lately known at Croydon as G-ACPX. This machine is flying on the Dublin-Bristol route.

I owe the authorities at Ostend airport an apology for stating some time ago that there were no adequate night lighting arrangements there on an occasion when Capt. Hattersley, of B.C.A., landed there on a special charter job. I wrote according to information received, and apparently verified at the time, but there seems to have been some misunderstanding. Capt. Hattersley informs me that the Ostend lighting equipment is entirely adequate and altogether admirable.

There is a story, which I hope is true, of one of these paunchy, overfed city men, abominably nervous about flying, questioning one of the gruffer senior pilots about the danger of the proceeding, and finally ending up with the words, "And I know I shall be awfully air sick." "Impossible," said the pilot. "Oh, why?" queried the other. "Bloke with no guts can't be sick—that's why," replied the pilot. The tale has a pleasantly Rabelaisian touch, to my way of thinking.

A. VIATOR.

Large-scale Air Survey

THE Ordnance Survey of Great Britain has placed a further contract with Aerofilms, Ltd., for vertical air photographs of many districts in the Midlands. The air survey is required to revise some 300 Ordnance plans to the scale of 1/2500 (25.344 inches to the mile).

Housing and road development have so completely altered the countryside that the majority of these large-scale Ordnance plans are out of date.

Developing Hedon

TWO proposals for the development of the present airport at Hedon, Hull, have been placed before the aerodrome committee. One company would take over the airport itself and develop it according to modern needs and the other would run the club, operate a taxi service and provide a sales organisation. It will be remembered that a new and better airport has been planned for the city.

Since the members of the committee spoke of "the gentleman," rather than of the "firm," we do not find it difficult to guess the name of the originator of the proposals. The committee's attitude suggested that they might wait for the findings of the Maybury Committee.

The Lightning Danger

ACCORDING to information given in *Notice to Airmen*, No. 62, in which the necessary precautions have been reiterated, the determining circumstances in nearly all the recorded cases of trouble from lightning have involved flying into or close below clouds with the trailing aerial out.

Whether or not the met. reports indicate the possibility of thundery conditions, pilots are advised to avoid all large cloud masses from which showers of rain, hail or snow are falling; hail is always to be regarded as dangerous. When radio is being used in the aircraft, an increase in the number and strength of atmospherics will generally indicate that a danger area is being approached.

If it is not possible to avoid dangerous areas, the trailing aerial should be earthed and wound in. Should the aircraft already be in a dangerous area, e.g., in a hailstorm, winding in the aerial may be dangerous to the radio operator.

In such a case, the aerial should merely be earthed and the aircraft flown out of the storm as quickly as possible; if necessary, it should be flown back on its course to give the operator an opportunity to wind in the trailing aerial before proceeding through the storm.

It is also recommended that the connection of the aerial to earth should be made to the aircraft structure outside the fuselage.

During thundery conditions the aircraft, even with the trailing aerial wound in, should be flown well below the lowest layer of any cloud masses encountered.

To the Gold Coast

ACCORDING to Sir Arnold Hodson, the Governor of the Gold Coast, there is a reasonable chance that an aerodrome at Accra should be ready before the end of the present year. Work at Takoradi will proceed as soon as the estimates have been passed.

CUBAN PERSONALITIES: Second from the left is Lt. Antonio Menendes, of the Cuban Naval Air Arm, who recently flew the South Atlantic in a Lockheed Sirius (425-525 h.p. Wasp). Wearing a sun helmet is Lt. Gustavo Novo, who assisted in the preparations. On the left and right are Edwin and Garth Lyder, friends of the pilot and enthusiastic readers of *Flight*.

Commercial Aviation

A French Invasion

SIXTEEN French private aeroplanes and two British Airways machines, each carrying thirteen passengers, brought members of the Touring Club of France to Heston on Saturday, May 16. Arrangements for their reception in England were in the hands of the A.A., and after a night in London and a day's sightseeing they returned to France on Sunday evening.

To Tibet

SINCE 1934, when they extended their operations up the Yangtze River to Chengtu, south to Canton and north to Peiping, using Loening amphibians, China National Aviation Corporation have progressed mainly in the matter of equipment. Douglas Dolphins and D.C.2s are in action over the routes and a number of Sikorsky S.43s are on order. A new extension has been in operation to Yunnan and last February a service between Canton and Hanoi was started.

Plans, however, are being made to extend the Shanghai-Chengtu service to Lhassa, and a survey flight will probably be made this summer by Capt. E. M. Allison, the chief pilot.

Eastern Extensions

IN order to secure a foothold in the markets of Siam Japan is to open an air service, before the end of the year, linking Bangkok with Tokio. It has been officially notified that the Japanese Air Transport Company has made arrangements for the service to begin in October or November, but it is not yet finally decided which route will be chosen from Formosa, and whether permission to fly over and land on foreign territory has been obtained.

Meanwhile, from Amsterdam comes news of an air mail link between that city and Japan. Leaving Amsterdam on Wednesday by the K.L.M. Eastern service the letters reach Penang on Saturday, and on the Monday they leave by Imperial Airways for Hong-Kong, arriving on Tuesday. A train takes them to Canton, and thence they are flown on Thursday by China National Aviation Corporation to Shanghai. The rest of the journey is made by boat, and the whole journey takes ten or eleven days, and shows considerable saving and increase of safety over the Trans-Siberian Railway.

Unless the G.P.O. has some objection, London correspondents could post to catch a 7.45 p.m. departure from London to Amsterdam on the Tuesday evening.

Rapides and Dragons

DURING the past month or so the De Havilland Company have received orders for Dragon Rapides from the Uruguayan Ministry of Public Heath, from Cook Strait Airways of New Zealand, and from the Iraq Petroleum Company. The first machine will be fitted up as an ambulance, while the second and third are additions, respectively, to fleets of two and three. Three Dragons have been ordered by the Turkish Ministry of Defence for military and general reconnaissance purposes.

A £500,000 Australian Merger

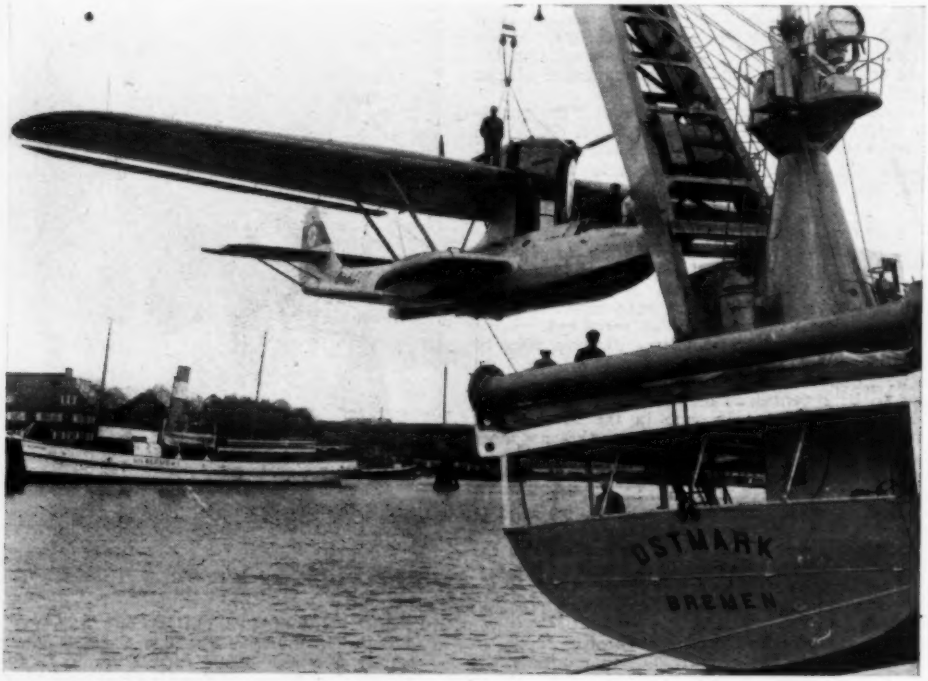
FIVE steamship companies have entered the field of aircraft operation in Australia by forming (or re-forming) Australian National Airways, a company with £500,000 capital. The companies concerned are the Holyman Steamship Co., the Adelaide Steamship Co., the Orient Line, Huddant Panker and the Union Steamship Co.

Holyman's and the Adelaide Steamship Co. have each, of course, been operating their own airline in Australia for some time, while the Union Company have been operating a New Zealand service.

The new company and the long-established and well-timed Qantas appear to be about to dominate the field of air transport in Australia. The Melbourne-Sydney-Brisbane mail route, incidentally, will shortly be provided with nine new emergency landing grounds. Five of these are between Sydney and Brisbane, and four between Melbourne and Sydney. They will be provided with light beacons—radio beacons being hardly necessary because of the almost complete absence of fog. On the Sydney-Brisbane section, sites have been selected at Evans Head, Cuff's Harbour and Kempsey (N.S.W.), and at Coolangatta (Queensland). The sites between Melbourne and Sydney are not yet finally selected.

The terminal aerodromes at Melbourne, Sydney and Brisbane are to be equipped with complete night-lighting equipment and two-way radio. Plans for all this work are well advanced and the work will be completed by about the end of the year at a cost of £40,000.

Coinciding as it does with news of the steamship companies' merger, this announcement indicates very clearly Australia's intention to push ahead vigorously with the development of air transport.

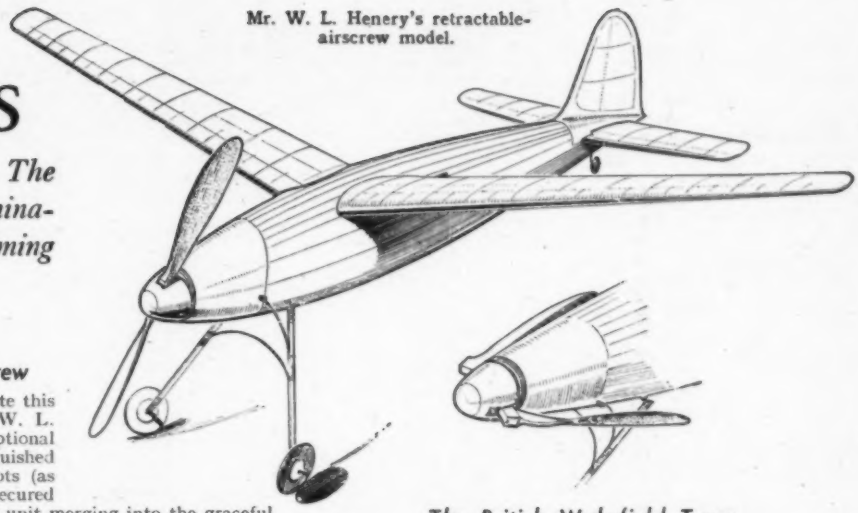


THE "OSTMARK" IN ACTION: By now the new D.L.H. catapult ship *Ostmark*, some plans for which were detailed in *Flight* of May 7, should be at Bathurst. During the week-end she made a trial trip in the Gulf of Lubeck. This picture shows a Dornier Do. 18 (two 500/560 Junkers Jumo 205 diesels) being hoisted aboard.

MODELS

Improving the Glide : The Wakefield Cup Eliminating Trials : Forthcoming Club Events

By M. R. KNIGHT



Mr. W. L. Henery's retractable-airscrew model.

With Retractable Airscrew

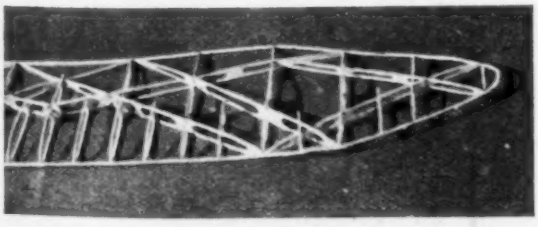
THE model which we illustrate this month, the work of Mr. W. L. Henery (T.M.A.C.), is of exceptional interest and ingenuity. Distinguished by the neatly filleted wing roots (as opposed to the usual elastic-secured centre section), and elegant tail unit merging into the graceful lines of the multi-sided fuselage, the machine has as its outstanding feature the airscrew, which is made to fold its blades when the power ceases.

Quite a sharp controversy rages in model aviation circles as to whether a free-wheeling airscrew sets up less resistance during the glide than the fixed variety. Mr. Henery offers an alternative to either, and reports a 30 per cent. increase in duration when his model is hand-launched as a glider. A lengthier test period is needed to determine whether his device secures sufficient advantages to justify the additional complication, but the experiment is certainly commendable.

The retracting mechanism is concealed in the spinner. Centrifugal force holds the pivoted airscrew blades outstretched during power flight, and, in fact, during the glide until the rotation is terminated by a trip, actuated by a rubber-tensioning mechanism. When the power runs out and the rubber skein slackens, the airscrew shaft is drawn forward by a compression spring in the forward end of the spinner. This brings a trip wire soldered to the shaft in contact with a stop on the rear face of the nose-block, and prevents the shaft turning. The airstream past the now stationary blades thereupon folds them back.

Wilfred (as the machine is known, owing to its rabbit-like appearance with " ears " folded) has a span of 45in., 6 degrees of dihedral, and a chord tapering from 5⅝in. to 3½in. The under surface is slightly concave, and the tips are slightly negative. Each half of the wing has two hard balsa projections which engage in slots in the fuselage, permitting a certain variation in longitudinal positioning, and allowing them to tumble out undamaged in the event of a rough landing.

The undercarriage is unusual in having the bamboo struts to the rear, with the wire springs in tension. The overall length of the model is 34in., and the total weight 6 oz. The structural material throughout is balsa wood, with Jap tissue covering, the wings and tail being clear doped, and the fuselage finished in aluminium. Fin and tail plane are separately detachable.



An original wing constructional system evolved by Mr. D. W. H. Owen, of Maidenhead, his idea being to secure an even cross-section, particularly at the wing-tips, prevent torsional movements, and stand up to wing-tip blows. The accompanying fuselage is a monocoque structure made from numerous strips of balsa, the thickness of paper, wound around a solid wooden template.

The British Wakefield Team

THE eliminating trials for the purpose of selecting a team of six to compete in America for the Wakefield International Trophy were held at Fairey's Great West Aerodrome on May 17. Potential soaring conditions were to some extent marred by the presence of a damp area, precursor of heavy rain, which fortunately held off until the conclusion of the trials. At times a stiff wind also hampered the contestants, but some excellent durations were achieved.

There was a greater variety of types than is usually to be met with, these including C. A. Rippon's model with airscrew behind the tail unit, a backswept low wing, and a neatly faired mid-wing, flown by the winner of the 1929 Wakefield contest, R. N. Bullock. Diamond section and monocoque fuselages were also to be seen. Though there was a preponderance of the familiar lightweight high-wing type, with one-piece cantilever wing flexibly coupled to a fuselage of rectangular section, one observed a pleasing tendency to use a circular or oval nose, merging into the straight sides.

The best result of the day was an average duration on three rise-off-ground flights of 268.3 sec. by J. B. Allman (Leamington and Warwick M.A.C.), winner of the Wakefield Cup in 1934. This effort brought him into the Wakefield Team, and won for him the Premier Shield donated to the S.M.A.E. by Mr. F. R. Barnard. Mr. Allman's high-wing model had the multi-skein motor with geared-up airscrew which he has sponsored for some time, the airscrew being of the variable pitch type. Two juniors, A. Greenhalgh, aged 11 (Lancs. M.A.S.), and H. A. Jones, aged 13 (N. Kent M.A.S.), earned inclusion in the team with averages of 220.5 and 166.9 sec. respectively. The other successful aspirants were D. Fairlie (Wembley M.F.C.), 215.03 sec.; A. A. Judge (T.M.A.C.), 156.8; and R. Copland (Northern Heights M.F.C.), 143.6.

These six stalwarts will sail from Southampton on June 20, and the writer and *Flight* join in the volume of good wishes (and fervent hope for the retrieving of the Cup!) which will accompany them to Akron.

June Fixtures

READERS are reminded that the popular " Northern Heights " Gala Day, details of which were given last month, will take place at Fairey's Great West Aerodrome on June 21, from 11 a.m.

On June 14 a contest for gliders will be flown simultaneously on the grounds of the various clubs affiliated to the S.M.A.E. Gliders will be launched by elastic cord, and the average of three attempts will count.

The Seaplane contest for the Lady Shelley Cup has in former years attracted numerous entries. It will take place this year on June 28, at 3 p.m., the lake in Danson Park, near Bexleyheath, again being the venue. Floatplanes and flying-boats are eligible, and the average will be taken of three rise-off-water attempts.

T.M.A.C. will hold a seaplane contest, open to non-members at a small fee, at Wimbledon on June 14. Disdaining ponds, they will make use of a portable canvas tank evolved and constructed by the competition secretary, Mr. H. Fialko.

The Moffett Trophy Trials

THE eliminating trials for the choosing of six models to represent Great Britain in the contest at Akron for the Admiral Moffett Trophy were held on the same occasion as the Wakefield Trials. The results were as follows:—H. Simmons (Blackheath M.F.C.), best of three rise-off-ground flights, 109.75 sec.; A. Worley (Northern Heights M.F.C.), 117 sec. W. Worden (T.M.A.C.), 106; C. Gibson (N. Kent M.A.S.), 105.5; G. Merrifield (Bournemouth M.A.S.), 104; K. M. Francis (Wembley M.F.C.), 102.4. The six models will be taken to America and flown by the British Wakefield Team.

T.M.A.C. Wimbledon Rally

THE 10th Group of T.M.A.C. will hold their second annual rally at Wimbledon on July 5, from 11 a.m. till dusk. All modellists are invited, and can enter the contests at a small fee. The six contests are for general duration (all types, "spa:s" included), heavyweights (5 oz. loading and over), scale models to any scale, gliders, seaplanes (using the portable tank), and an inter-club team competition. Further information can be obtained from the Group Leader and Organiser, Mr. C. H. Orchard, 26, Tennyson Avenue, Motspur Park, Surrey.

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The latest edition of *The Green Book*, 4d. post free from Model Aircraft Supplies, Ltd., 171, New Kent Road, London, S.E.1, not only contains a catalogue of their various model materials brought up to date by judicious elimination and the inclusion of sundry new items, but a wealth of sound information on design and construction.

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THE revised edition of *The Boys' Book of Model Aeroplanes*, by Francis A. Collins, published at 6s. by the D. Appleton-Century Co., contains a lucid explanation of flight, and much useful constructional information, but more drastic revision would be an improvement. In particular, the references to the Wright and Bleriot machines as if they were existing types is confusion and tends to give a wrong impression of the value of the book as a whole.

Industrial Gases

FEW people in the aircraft industry need any introduction to the products of the British Oxygen Company, especially in the matter of oxygen and acetylene for welding. On the other hand, members of each individual industry using the Company's products are understandably ignorant of the wide field it covers in other industries.

Some idea of the extent of this field was obtainable during a visit last week to the company's fine new offices, which occupy one of the vast floors of Thames House, Westminster.

It was revealed that in addition to the familiar oxygen and acetylene, the B.O.C. manufactures and compresses hydrogen, coal gas, nitrogen, carbon dioxide, nitrous oxide, argon, helium, neon, ethylene, and numerous mixtures of various of these gases, a surprising number of them, incidentally, being required for medical purposes. When it is added that the Company also manufactures much of the equipment which the use of these gases involves, one begins to appreciate why it has no fewer than thirty-three factories and twenty-two depots in the British Isles, and many allied companies overseas.

Facilitating Bearing Production

BRITISH TIMKEN, LTD., well known as manufacturers of taper roller bearings, the fundamental principal of which bearing embodies the ability to absorb a combination of thrust and radial load, have received increasingly heavy demands for large-capacity bearings and in consequence have been compelled to formulate new production programmes.

Consultations, which have taken place between the engineers of British Timken, Ltd and the Churchill Machine Tool Co., Ltd., over a period of two years, have resulted in the installation of a precision grinding machine which has not only the ability to handle large diameter cups and cones in single operation, but gives a considerable range in diameter and length not as yet fully expounded. In addition, the machine is capable of grinding internal and external surfaces, spherical end faces and ball tracks.

The grinder, which has now been in operation for several weeks at the Birmingham works of British Timken, Ltd. is at the present moment working with experimental grinding wheels, and it is stated that even on these wheels the reduction in grinding time, as compared with the machines used hitherto, is amazing. It is claimed that, at a rough estimate, as much as 75 per cent. reduction in grinding time has been effected.

AERONAUTICAL PATENT SPECIFICATIONS

(The numbers in brackets are those under which the Specifications will be printed and abridged, etc.).

(*Published May* 21, 1936).

29848. MESSERSCHMITT, W.: Aeroplane wings (446,094).
30230. KRAFFT, E., and WEICHARDT, R. (trading as KRAFFT AND WEICHARDT): Apparatus for manipulating aircraft landing sails (446,011).
4760. ARMSTRONG SIDDELEY MOTORS, LTD., and FELL, L. F. R.: Ignition systems for multi-cylinder engines (446,126).
6155. LORENZ AKT.-GES., C.: Aeroplane landing systems employing electro-magnetic waves (445,976).
12246. FAIREY AVIATION CO., LTD., LOBELLE, M. J. O., ORDIDGE, F. H., and HOLROYD, F.: Adjustable hood for aircraft and the like (446,134).
21443. NAAMLOOZE VENNOOTSCHAP NEDERLANDSCHE INSTRUMENTEN CIE NEDINSCO: Apparatus for directing fire against aerial attack (446,055).
26034. JACQUEMIN, A. F.: Aircraft with transversely hinged wings (445,992).

(*Published May* 28, 1936).

30670. BILLING, N. P.: Aircraft (446,509).
31381. SMOLIK, A.: Gun arrangements for aircraft (446,295).
15649. FAIREY AVIATION CO., LTD., and FORSYTH, A. G.: Radiators for the cooling systems of internal-combustion engines, particularly for aircraft (446371).
34788. GOETZ, A.: Airships (446,563).
25939. ETABLISSEMENTS BOILOT: Trailer for airplanes or similar machines (446,483).

(*Published June* 4, 1936).

6777. ESCHER WYSS MASCHINENFABRIKEN AKT.-GES.: Screw propeller for water and air vehicles (446,852).
7439. BRISTOL AEROPLANE CO., LTD., FEDDEN, A. H. R., AND BUTLER, L. F. G.: Aircraft having air-cooled internal-combustion engines (446,702).
9261. SOC. ANON LE MOTEUR SATURNE.: Internal-combustion engine of four-stroke-cycle type for aircraft (446,704).
2945. HEINE, H., (trading as HEINE MÖBELFABRIK PROPELLERWERK, H.): Adjustable air propellers (446,164).

CHANGES OF NAME

HILLMAN AND CROSS LTD. (Aeronautical engineers, etc., Maylands Aerodrome, Romford).—Name changed to Essex Aero Ltd., on May 8, 1936

NEW COMPANIES

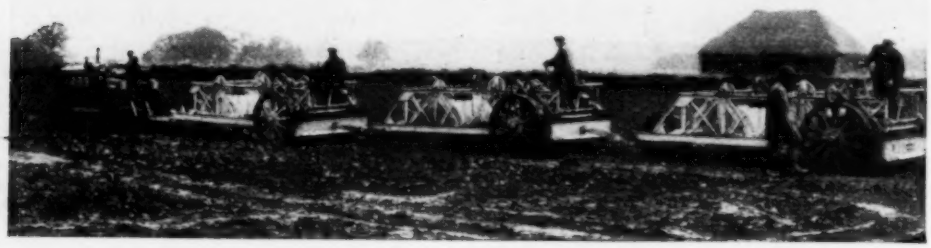
In the notes below, for reasons of space, the 'objects" of new companies are usually somewhat abbreviated.

LISSON AIRCRAFT AND PRECISION ENGINEERING CO., LTD. Private company, Registered May 15. Capital £5,000 in 4/- shares. Objects: To carry on business as iron masters and founders, steel makers, engineers, manufacturers of aeroplanes, seaplanes and other aircraft, motor cars, etc. The first directors are to be appointed by the subscribers. Registered office: 53, Doughty Street, John Street, London, W.C.1.

COVENTRY AERO ENGINES AND COMPONENTS LTD., was registered as a public company on May 25, with a nominal capital of £100 in 5/- shares. Objects: to manufacture and deal in aircraft of all kinds, internal combustion and other engines, and component parts, etc. The first directors are not named. Solicitors: Stephenson, Harwood and Tatham, 16, Old Broad Street, London, E.C.2.

INCREASES OF CAPITAL

AIR HIRE LTD. (Heston Airport, Heston, Mdx.). The nominal capital has been increased by the addition of £2,000 in £1 ordinary shares beyond the registered capital of £5,000.



Grading: A Cletrac tractor at work on aerodrome construction. It is claimed that tractors of this make have been used on every aerodrome laid down by the Air Ministry in this country. Cletrac tractors are handled by Blaw-Knox Ltd., New Oxford House, Hart Street, London.